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ABSTRACT

This curriculum guide is one of a series of five books published to supply all appropriate information related to the Hewlett-Packard Mathematics Drill and Practice Program for the computer. This text serves as the primary reference source for the program. The content is divided into two sections. A brief explanation of the curriculum structure is contained in section 1. Each year of drill and practice material is divided into 24 blocks. Each lesson in a block has five levels of difficulty. Section 2 is a description of the curriculum from grades one through six indexed by year, block, and level. (MP)

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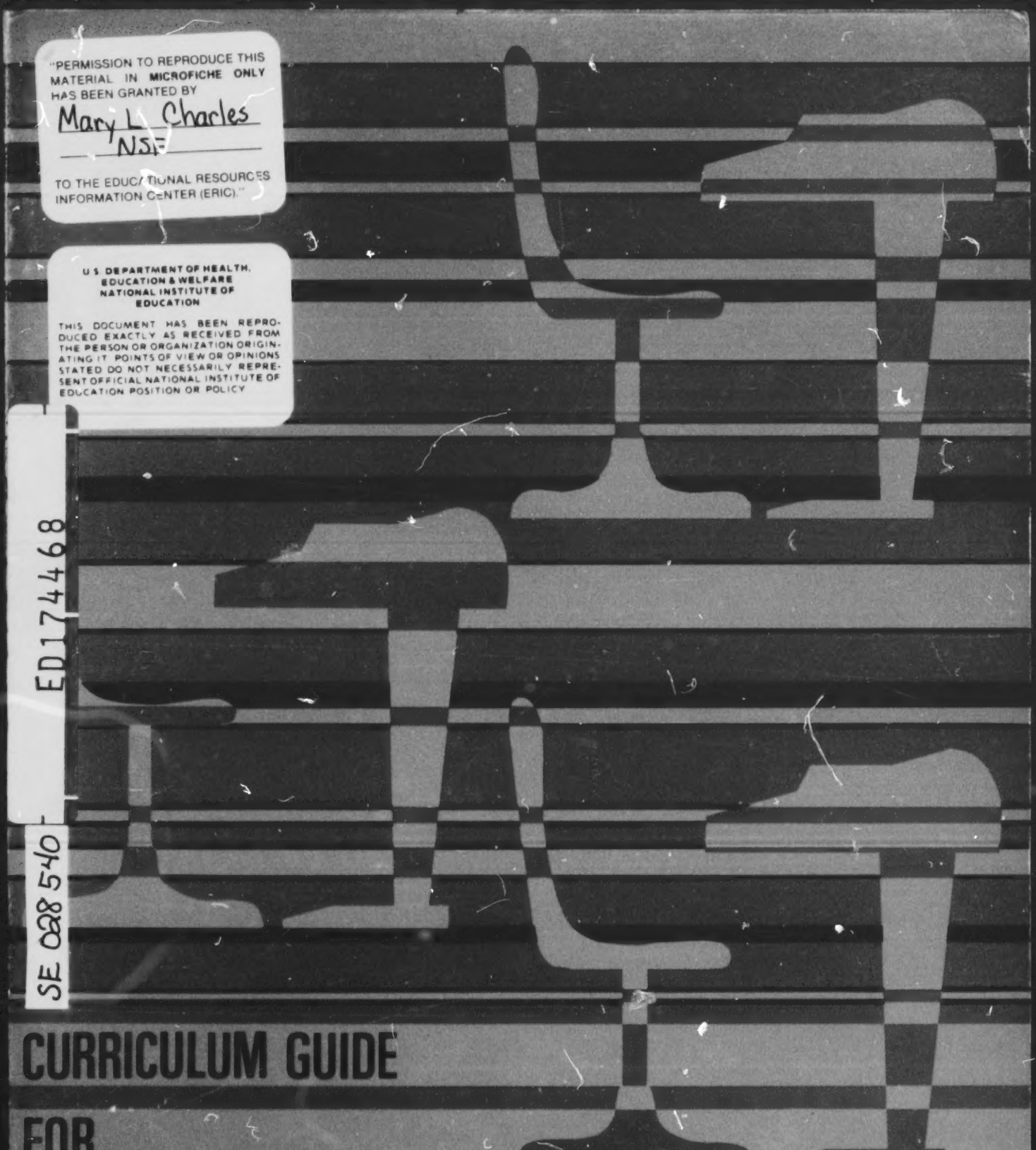

CURRICULUM GUIDE FOR HP MATHEMATICS DRILL AND PRACTICE PROGRAM

CURRICULUM GUIDE

FOR

HP MATHEMATICS DRILL AND PRACTICE PROGRAM

HEWLETT hp PACKARD
11000 Wolfe Road
Cupertino, California 95014

HP 5950-9293

August 1970

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HP acknowledges the editorial assistance of Robert M. Gordon, University of California Irvine, California.

PREFACE

The *CURRICULUM GUIDE* is one of a series of five books published to supply all appropriate information related to the HP MATHEMATICS DRILL AND PRACTICE PROGRAM. Other books in this series are:

INTRODUCTION TO THE HP MATHEMATICS DRILL AND PRACTICE PROGRAM
TEACHER'S HANDBOOK FOR THE HP MATHEMATICS DRILL AND PRACTICE PROGRAM
OPERATING PROCEDURES FOR THE HP MATHEMATICS DRILL AND PRACTICE PROGRAM
PROCTOR'S HANDBOOK FOR THE HP MATHEMATICS DRILL AND PRACTICE PROGRAM

The *INTRODUCTION* is for general readership. Teachers will find the *TEACHER'S HANDBOOK* and the *CURRICULUM GUIDE* of interest. Proctors and the system operator will use the *PROCTOR'S HANDBOOK* and the *OPERATING PROCEDURES*, respectively.

Contact your local HP field representative to order additional copies of these books.

INTRODUCTION

This text serves as the primary reference source for the HP Mathematics Drill and Practice Program (D&P PROGRAM).

A brief explanation of the curriculum structure is contained in Section I.

Section II is an indexed description of the curriculum. Tabs are printed on the edge of the first page of each year for easy reference.

See the Appendices for a D&P PROGRAM vocabulary, lists of symbols used.

NOTE: The description in Section II gives general examples of problems in the curriculum. Since the specific numbers presented to students are likely to be different for each student, only the general forms are listed in Section II. For example, if a student is presented with "Sums 1 to 10," he might see a problem such as:

3 + 3 = _____

The general form for this problem is presented as:

a + b = _____ (Sums 1 to 10)

In this way, all possible types of problems can be represented without listing all possible combinations of numbers used in the D&P PROGRAM.

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APPENDIX A: SYMBOLS USED IN THE PROGRAM

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SECTION I CURRICULUM STRUCTURE

The HP Mathematics Drill and Practice curriculum covers six years (1-6).

Each year of drill and practice material is divided into 24 blocks. Each block contains a pretest, five main lessons, and a post-test.

The pretest is given to the student at the beginning of a block, and the post-test follows the main lessons.

Each of the five main lessons in a block has five levels of difficulty. Level 5 is the most difficult, and level 1 is the least difficult.

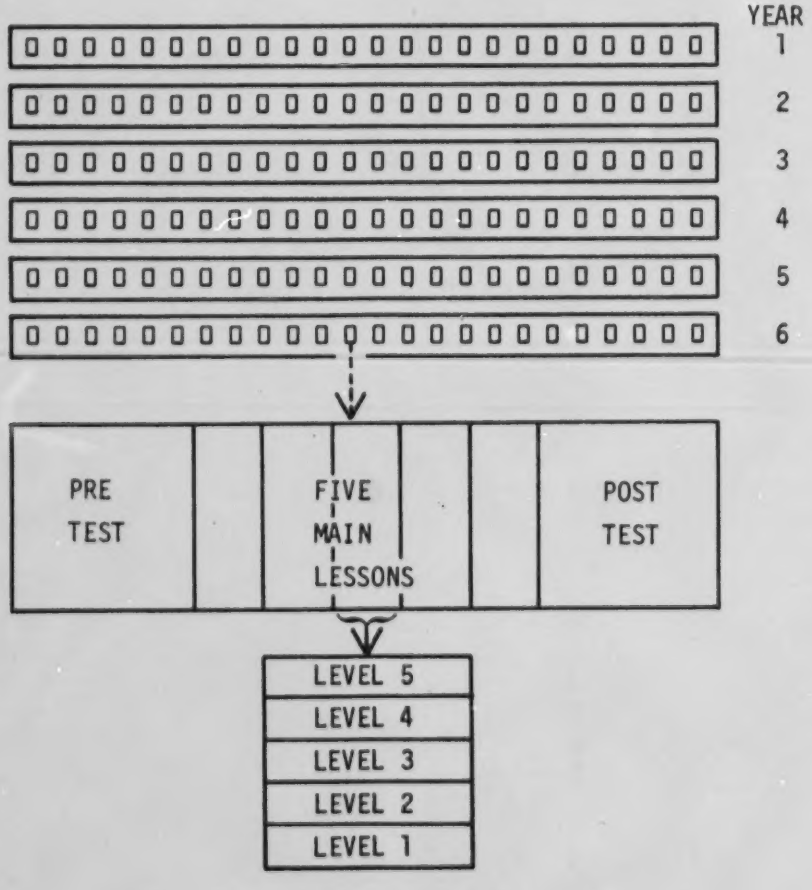


Figure 1-1. Curriculum Structure Summary

BLOCKS

Each year in the D&P PROGRAM is divided into 24 blocks. The division into blocks is made on the basis of the material presented. For example, block 1 in year 1 presents "Counting, zero to nine." Year 5, block 13 presents material on "Measure and Decimals." The organization of material into blocks in the D&P PROGRAM is similar to the organization of material into chapters of a book. The blocks are arranged in a sequence, and the student works from one block to the next, just as he would cover material in the chapters of a drill and practice workbook. In this case, however, the students work is automatically checked, corrected, and recorded. The "book" has been written for the individual student.

PRETESTS

Before he starts on a block, each student takes a pretest. The pretest is presented at an equal level of difficulty for all students. That is, all students taking the pretest cover equally difficult material. The student's score on the pretest determines the difficulty of material presented to him as he "moves" through the block. See the Teacher's Handbook for a detailed explanation of test scoring, and its effect on the student's movement through the curriculum structure.

MAIN LESSONS

The five main lessons in a block contain the drill and practice work for the block. Each lesson contains 10 to 20 problems designed to drill the student on the concepts presented in the block.

LEVELS OF DIFFICULTY

Each main lesson contains material arranged into five separate levels of difficulty. The general type of material covered in each lesson is the same but, for example, level 5 of a lesson is more difficult for a student than level 4; level 3 more difficult than level 2, and so on. The criteria for determining the level of difficulty varies from lesson to lesson. In some lessons, the more difficult levels have larger numbers. In others, the format of the problems is more difficult to grasp at the higher levels. The best way to determine the nature of the different levels of a lesson is to sit down at a student terminal, and run the TEST routine, which produces any lesson and level in the program curriculum at your request.

REVIEWS

Each student is tested on the material contained in every block he takes. Any block for which the student scored less than 85% on the post-test is scheduled for review.

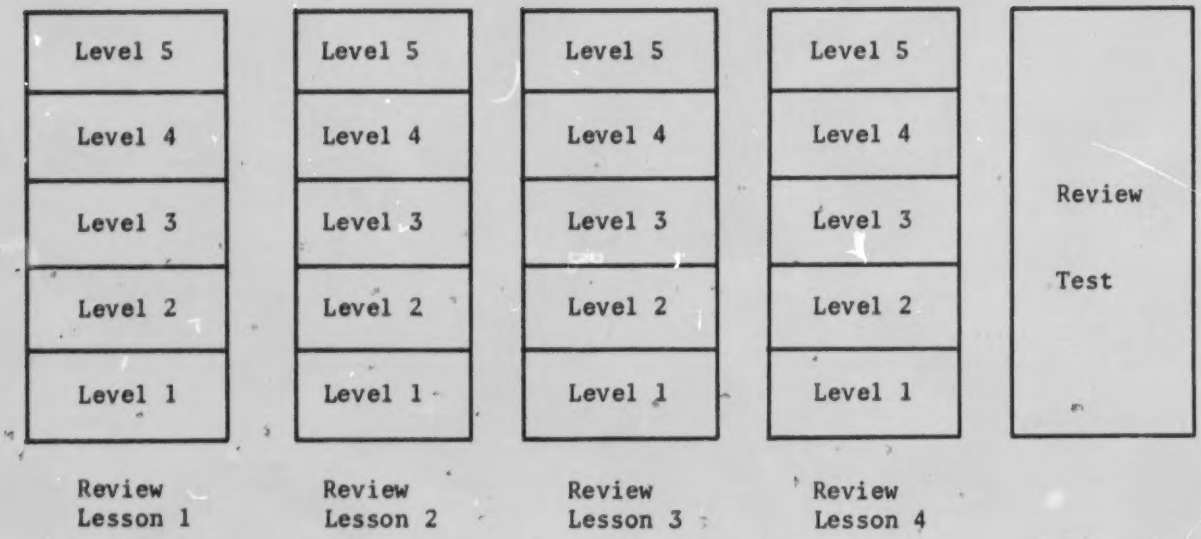
Review material is presented to the student after his main lesson. For example, if a student takes five main lessons in his next five sessions at the terminal and if he has a block scheduled for review, his sessions are divided between new and review material as follows:

Main Lesson 1	Session 1
Review Material	
Main Lesson 2	Session 2
Review Material	
Main Lesson 3	Session 3
Review Material	
Main Lesson 4	Session 4
Review Material	
Main Lesson 5	Session 5
Review Material	

The student is given a review lesson only after working on a main lesson. (No review material is given after taking a pretest or post-test.) Review material presented at a terminal session is usually about half as long as the main lesson material. For example, main lessons consist of 10 to 20 problems while review lessons have only 5 to 10 problems.

Structure of Review Lessons

Each review lesson has a structure similar to the original block. There are four main lessons, (five levels of difficulty each) followed by a Review Test:



Content of Review Lessons

Review lessons are about half as long as the original lesson and contain a sampling of each type of problem presented in that lesson. In other words, the quantity of material in a review lesson is less than in the original lesson, but the type of material is the same.

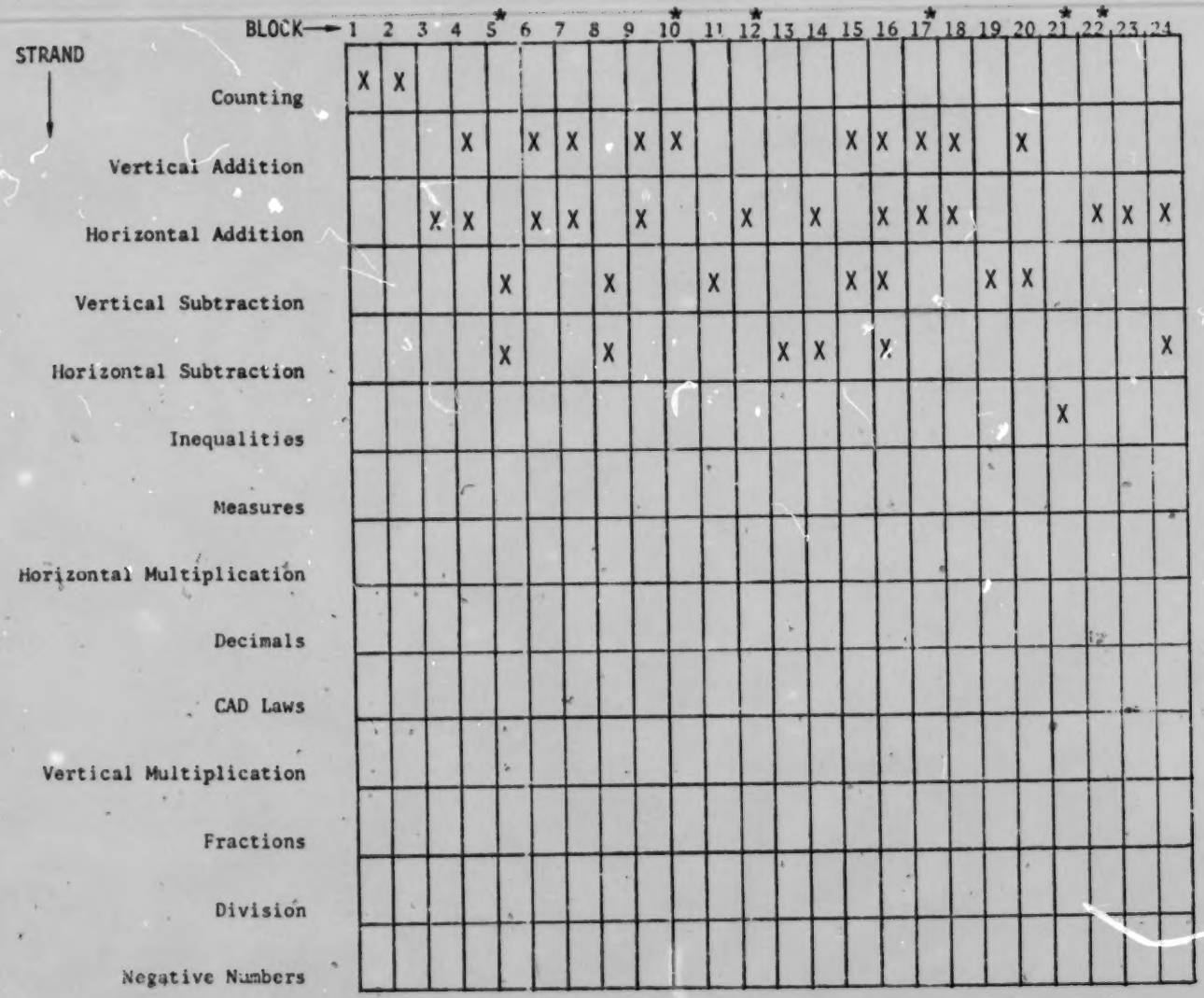
Scheduling of Review Lessons

Review lessons are put in a student's schedule on an individual basis, depending on his scores and his current block. See the Teacher's Handbook for full details on scheduling review lessons.

SECTION II

CURRICULUM INDEX

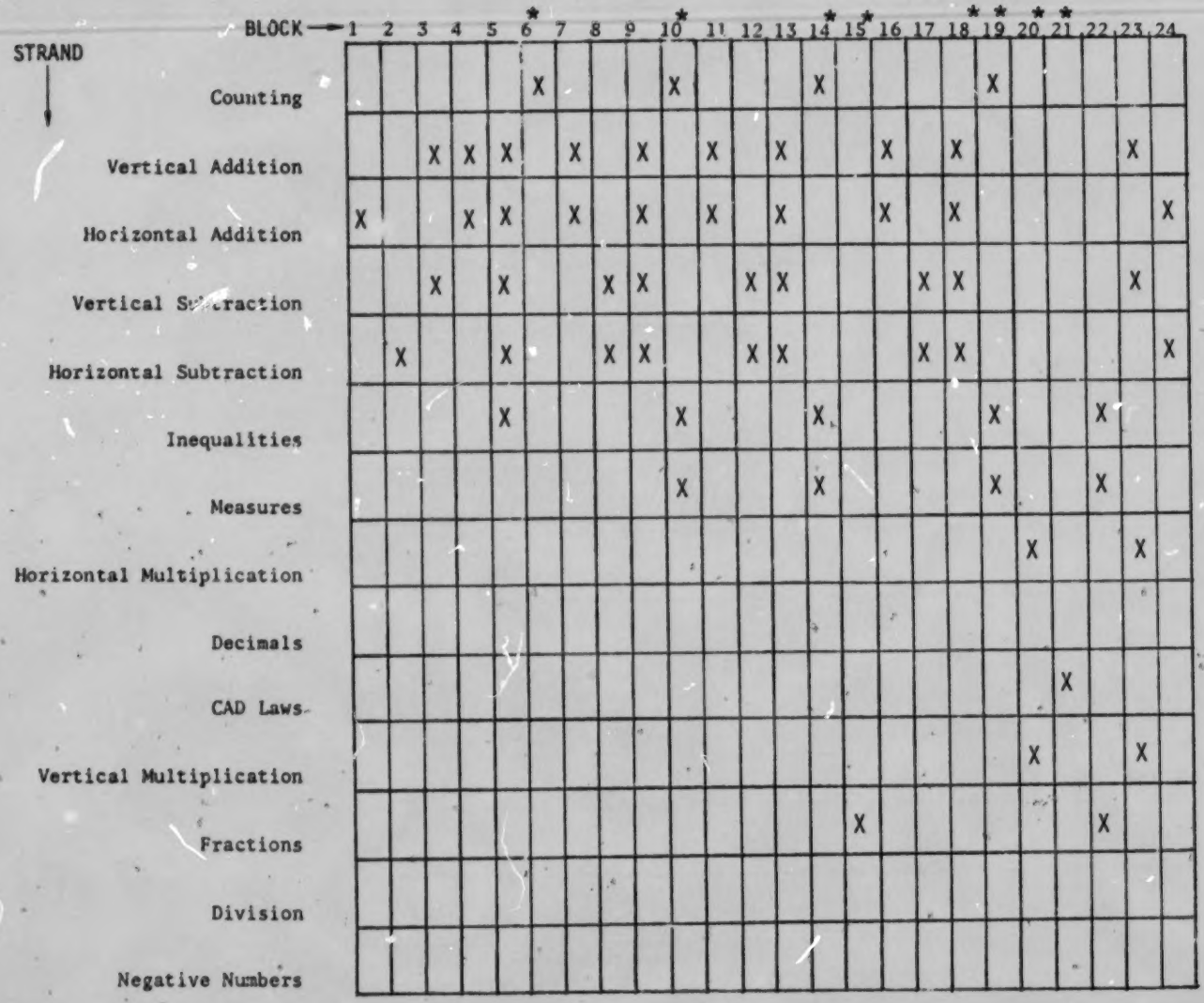
CURRICULUM INDEX - YEAR 1



*Block contains a new concept

INDEX - YEAR 1

CURRICULUM INDEX - YEAR 2



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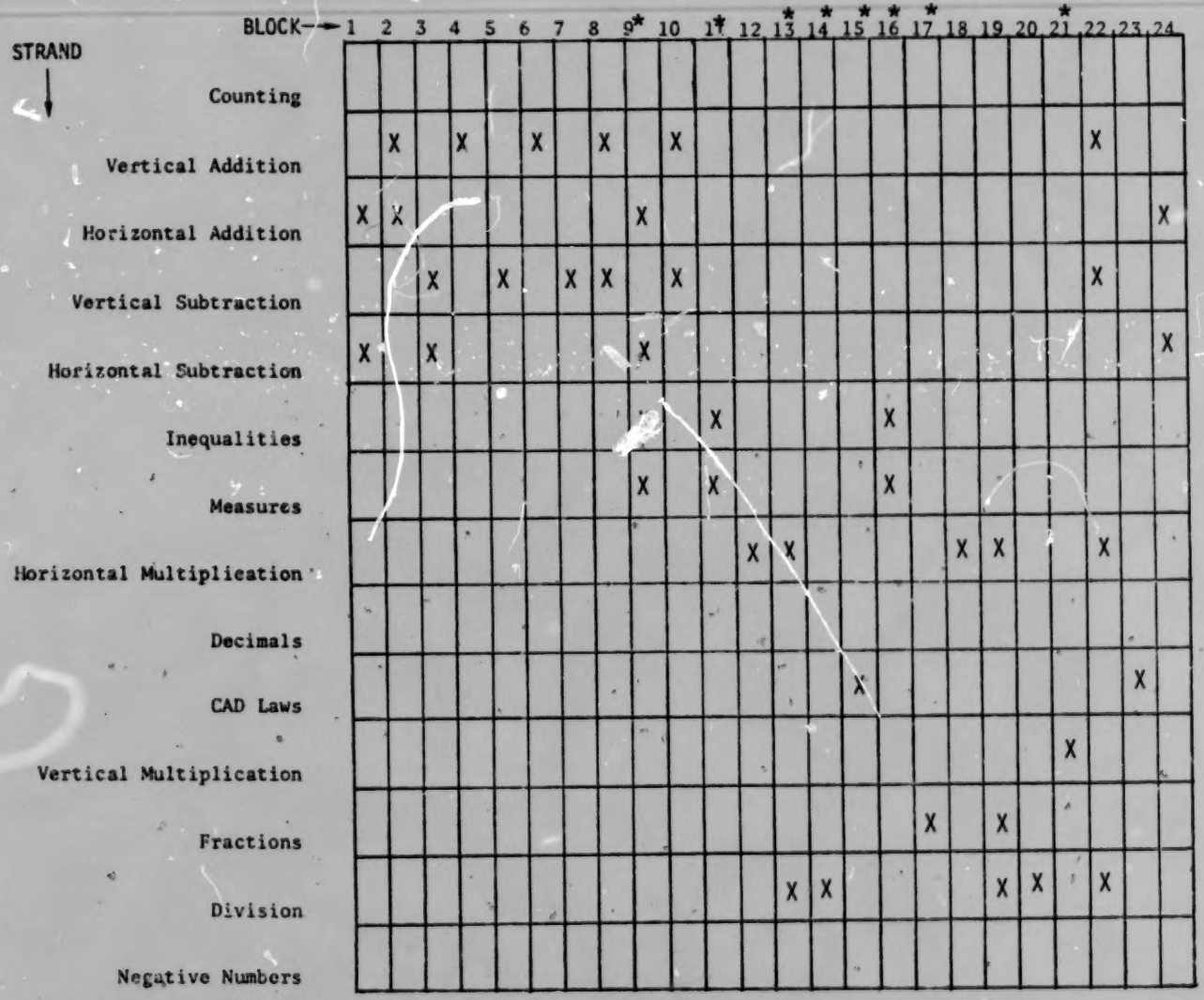
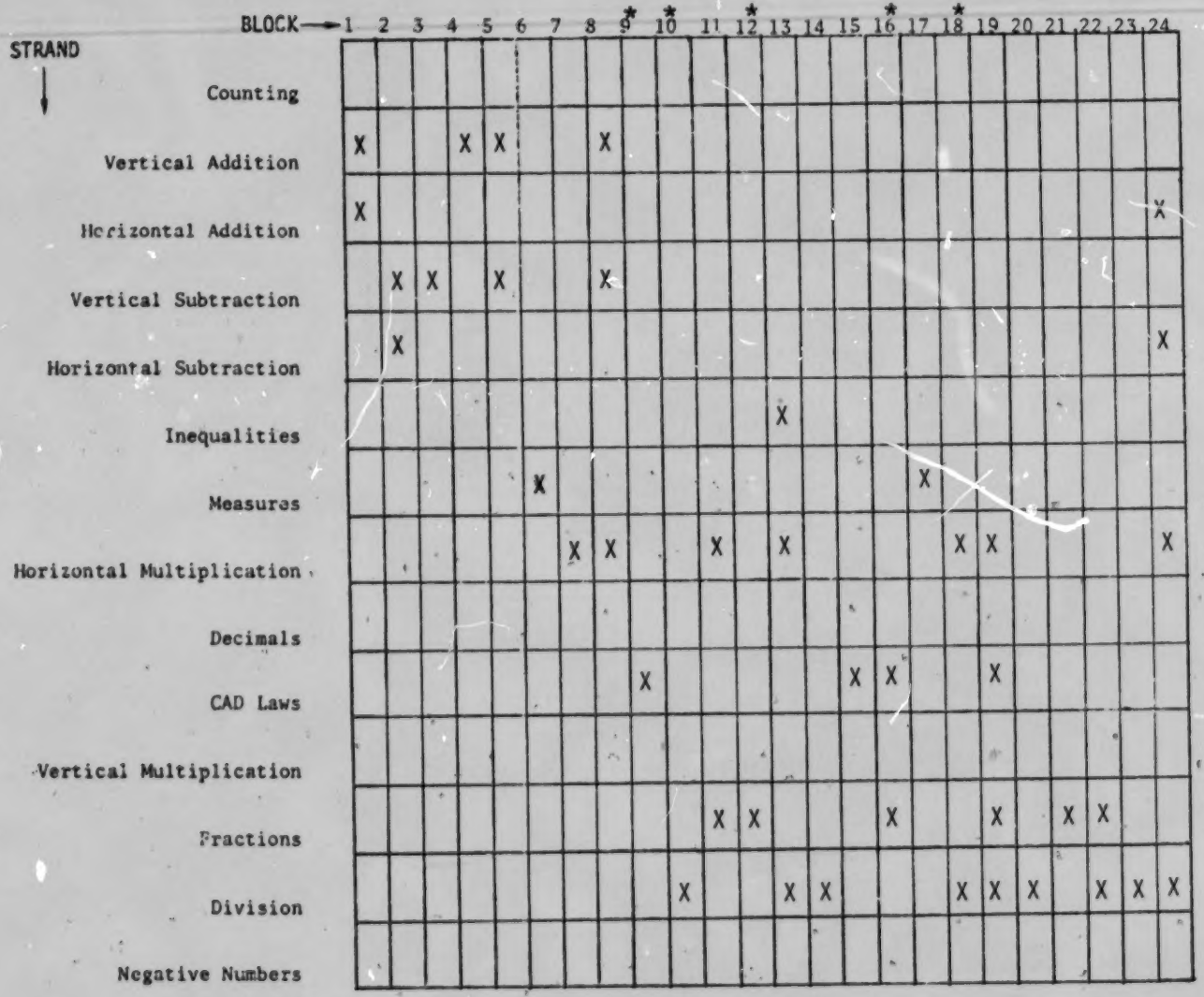
CURRICULUM INDEX - YEAR 3



*Block contains a new concept

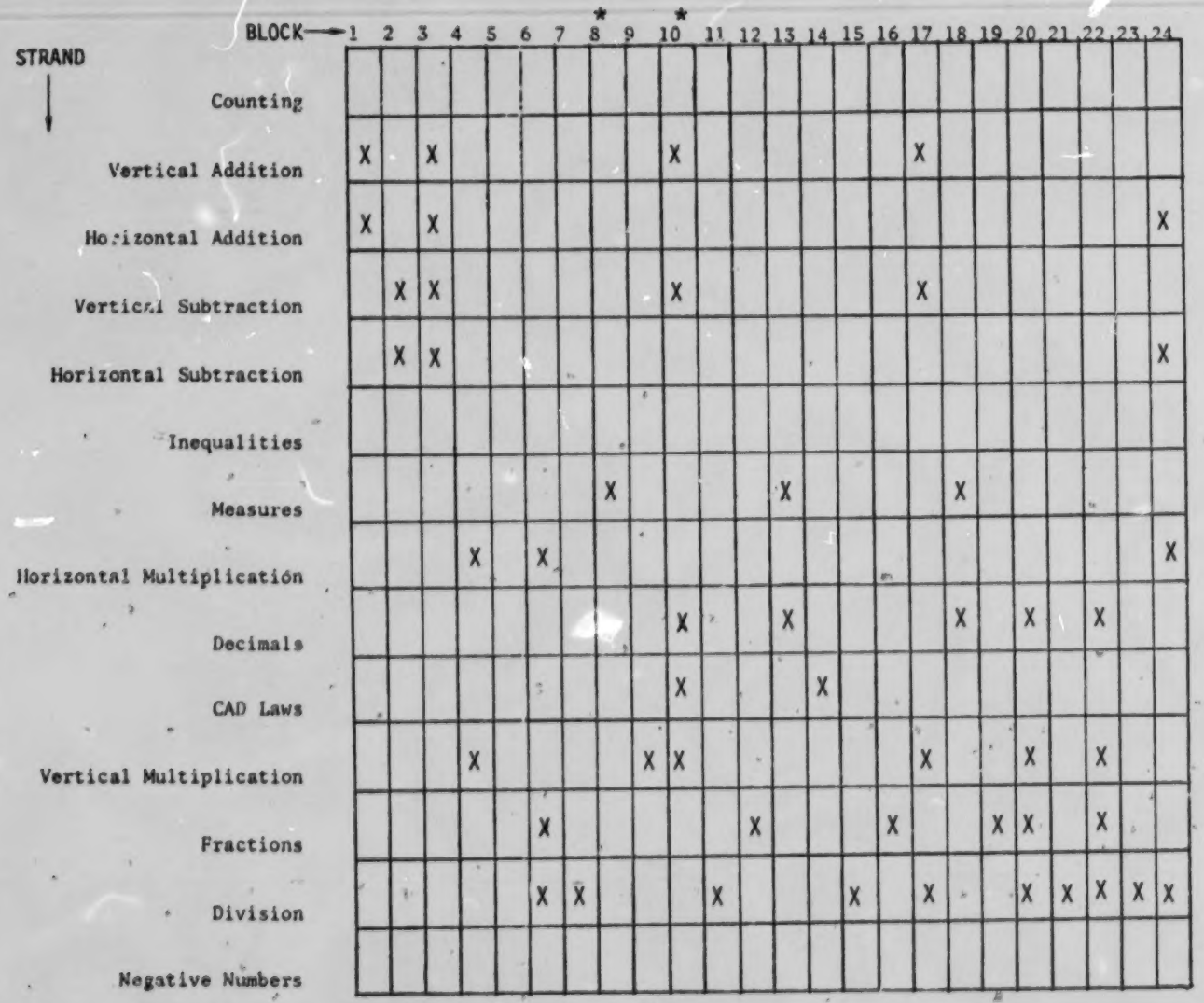
INDEX - YEAR 3

CURRICULUM INDEX - YEAR 4



*Block contains a new concept

CURRICULUM INDEX - YEAR 5

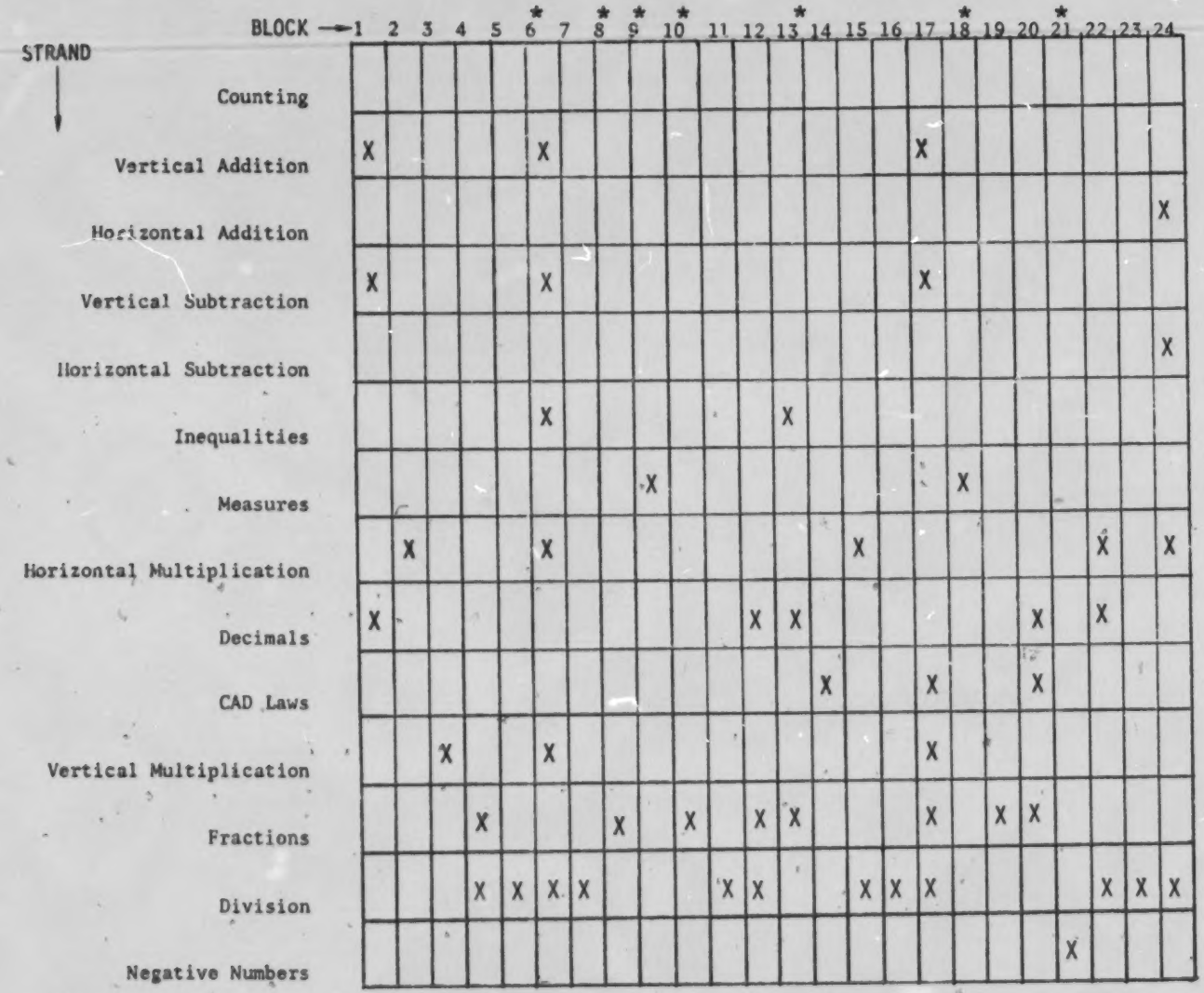


*Block contains a new concept

INDEX - YEAR 5

2-6

CURRICULUM INDEX - YEAR 6



*Block contains a new concept

SUMMARY - YEAR 1

BLOCK	DESCRIPTION
1	Counting, 0-9
2	Counting in Sequence
3	Addition, Sums to 4, Horizontal Format
4	Addition, Sums to 4, Horizontal and Vertical Format
5	Subtraction, Minuends to 4, Horizontal and Vertical Formats
6	Addition, Sums to 6, Horizontal and Vertical Format
7	Addition, Sums to 7, Horizontal and Vertical Format
8	Subtraction, Minuends to 7, Horizontal and Vertical Format
9	Addition, Sums to 9, Horizontal and Vertical Format
10	Addition, Sums to 10, Vertical Format
11	Subtraction, Minuends to 10, Vertical Format
12	Addition, Sums to 10, Horizontal Format With Variables
13	Subtraction, Minuends to 10, Horizontal Format With Variables
14	Addition and Subtraction, Sums or Minuends to 10, Horizontal Format
15	Addition and Subtraction, Sums or Minuends to 10, Vertical Format
16	Addition and Subtraction, Sums or Minuends to 10, Horizontal and Vertical Format
17	Addition (3 addends), Horizontal and Vertical Format
18	Column Addition, Horizontal and Vertical Format
19	Subtraction, Minuends to 10, Vertical Format
20	Addition and Subtraction, Sums or Minuends to 10, Vertical Format
21	Inequalities; Addition, and Subtraction, Horizontal Format
22	Addition, Sums to 10, Horizontal Format
23	Addition, Sums to 10, Horizontal Format With Variables
24	Special Mixed Drills on Addition and Subtraction

10 problems per main lesson
5 - 6 problems per review lesson
16 problems per main test
8 - 10 problems per review test

YEAR 1
BLOCK 1

DESCRIPTION: Counting, 0 - 9

Level	Type	Notes
1	"How many __ X __ 's",	One randomly-selected character presented 0 to 5 times.
2	"How many __ X __ 's",	One character, 0 to 9 times.
3	"How many __ X __ 's",	Two randomly-selected characters are presented and the student is asked how many of one of them (0 to 9) are presented.
4	"How many __ X __ 's",	Two randomly-selected characters are presented and the student is asked how many of one of them (0 to 9) are presented. A greater percentage of problems have the larger number.
5	"How many __ X __ 's",	Two, three or four randomly-selected characters are presented and the student is asked how many of (0 to 9).

YEAR 1
BLOCK 2

DESCRIPTION: Counting in Sequence. All problems are in the sequence a, b, c, d, e with the blank randomly assigned, e.g., 1, 2, __, 4, 5 or 1, __, 3, 4, 5.

Level	Type	Notes
1	Counting to 5,	One blank
2	Counting to 10,	One blank
3	Counting to 20,	One blank
4	Counting to 12,	Two blanks
5	Counting to 20,	Two blanks

YEAR 1
BLOCK 3

DESCRIPTION: Addition, Sums to 4, Horizontal Format

Level	Type	Notes
1	a + b = __	Sums to 3
2	a + b = __	Sums to 4
3	a + b = __	Sums to 4
4	a + __ = c	Sums to 4
5	__ + b = c	Sums to 4

YEAR 1
BLOCK 4

Description: Addition, Sums to 4, Horizontal and Vertical Format

Level	Type	Notes
1	a + b = __	Sums to 4
2	a + b = __ a +b __	Sums to 4
3	a + __ = c __ + b = c a +b __	Sums to 4
4	a + b = __ a + __ = c __ + b = c a +b __	Sums to 4
5	a + b = __ a + __ = c __ + b = c a +b __	Sums to 4

YEAR 1
BLOCK 5

DESCRIPTION: Subtraction, Minuends to 4, Horizontal and Vertical Formats

Level	Type	Notes
1	a - b = __	Minuends to 4
2	a - b = __ a -b	Minuends to 4
3	a - __ = c __ - b = c a -b	Minuends to 4
4	a - b = __ a - __ = c __ - b = c a -b	Minuends to 4
5	a - b = __ a - __ = c __ - b = c a -b	Minuends to 4

YEAR 1
BLOCK 6

DESCRIPTION: Addition, Sums to 6, Horizontal and Vertical Format

Level	Type	Notes
1	a + b = __ a +b	Sums to 5
2	a + b = __ a +b	Sums to 6
3	a + b = __ a +b	Sums to 6
4	a + __ = c	Sums to 6
5	__ + b = c	Sums to 6

YEAR 1
BLOCK 7

DESCRIPTION: Addition, Sums to 7, Horizontal and Vertical Format

Level	Type	Notes
1	a + b = __ a +b	Sums 0 to 7
2	a + b = __ a +b	Sums 0 to 7
3	a + b = __ a +b	Sums 5 to 7
4	a + b = __ a + __ = c a +b	Sums 4 to 7
5	a + __ = c __ + b = c a +b	Sums 4 to 7

YEAR 1
BLOCK 8

DESCRIPTION: Subtraction, Minuends to 7, Horizontal and Vertical Format

Level	Type	Notes
1	a - b = __ a -b	Minuends 0 to 7
2	a - b = __ a -b	Minuends 0 to 7
3	a - b = __ a -b	Minuends 5 to 7
4	a - b = __ a - __ = c a -b	Minuends 4 to 7
5	a - __ = c __ - b = c a -b	Minuends 4 to 7

YEAR 1
BLOCK 9

DESCRIPTION: Addition, Sums to 9, Horizontal and Vertical Format

Level	Type	Notes
1	a + b = __ a +b	Sums to 9
2	a + b = __ a +b	Sums 5 to 9
3	a + b = __ a +b	Sums 6 to 9
4	a + __ = c	Sums to 9
5	__ + b = c	Sums to 9

YEAR 1
BLOCK 10

DESCRIPTION: Addition, Sums to 10, Vertical Format

Level	Type	Notes
1	a +b	Sums to 5
2	a +b	Sums to 8
3	a +b	Sums 5 to 8
4	a +b	Sums 5 to 10
5	a +b	Sums 7 to 10

YEAR 1
BLOCK 11

DESCRIPTION: Subtraction, Minuends to 10, Vertical Format

Level	Type	Notes
1	a -b	Minuends 0 to 5
2	a -b	Minuends 0 to 8
3	a -b	Minuends 5 to 8
4	a -b	Minuends 5 to 10
5	a -b	Minuends 7 to 10

YEAR 1
BLOCK 12

DESCRIPTION: Addition, Sums to 10, Horizontal Format, With Variables

Level	Type	Notes
1	a + b = K K = __	Sums to 8
2	a + K = c K = __ c = a + K K = __ K + b = c K = __ c = K + b K = __	
3	a + b = K K = __	Sums 7 to 10
4	a + K = c K = __ c = a + K K = __ K + b = c K = __ c = K + b K = __	Sums 7 to 10
5	a + k = c + d K = __ K + b = c + d K = __ a + b + c + K K = __ a + b = K + d K = __	Sums to 10

YEAR 1

BLOCK 13

DESCRIPTION: Subtraction, Minuends to 10, Horizontal Format, With Variables

Level	Type	Notes
1	a - b = K K = __	Minuends 0 to 8
2	a - K = c K = __ K - b = c K = __ c = a - K K = __ c = K - b K = __	Minuends 0 to 8
3	a - b = K K = __	Minuends 7 to 10
4	a - K = c K = __ K - b = c K = __ c = a - K K = __ c = K - b K = __	Minuends 7 to 10
5	a - b = c - K K = __ a - b = K - d K = __ a - K = c - d K = __ K - b = c - d K = __	Minuends 0 to 10

YEAR 1
BLOCK 14

DESCRIPTION: Addition and Subtraction, Sums or Minuend to 10, Horizontal Format

Level	Type	Notes
1	a + b = __ a - b = __	Sums or minuends to 4
2	a + b = __ a - b = __	Sums or minuends to 6
3	a + b = __ a + __ = c a - b = __ a - __ = c	Sums or minuends to 8
4	a + b = __ a + __ = c a - b = __ a - __ = c	Sums or minuends to 10
5	a + __ = c __ + b = c a - __ = c __ - b = c	Sums or Minuends to 10

YEAR 1
BLOCK 15

DESCRIPTION: Addition and Subtraction, Sums or Minuends to 10, Vertical Format

Level	Type		Notes
1	a +b	a -b	Sums or minuends to 6
2	a +b	a -b	Sums or minuends to 8
3	a +b	a -b	Sums or minuends to 10
4	a +b	a -b	Sums or minuends 5 to 10
5	a +b	a -b	Sums or minuends 7 to 10

YEAR 1
BLOCK 16

DESCRIPTION: Addition and Subtraction, Sums or Minuends to 10, Horizontal and Vertical Format

Level	Type	Notes
1	a + __ = c a - __ = c a +b a -b	Sums or Minuends to 6
2	a + __ = c a - __ = c a +b a -b	Sums or Minuends to 8
3	a + __ = c a - __ = c a +b a -b	Sums or Minuends to 10
4	a + __ = c a - __ = c a +b a -b	Sums or Minuends 5 to 10
5	a + __ = c a - __ = c a +b a -b	Sums or Minuends 7 to 10

YEAR 1

BLOCK 17

DESCRIPTION: Addition (3 addends), Horizontal and Vertical Format

Level	Type	Notes
1	a + b + c = __	Sums to 5
2	a b +c	Sums to 8
3	a + b + c = __ a b +c	Sums to 8
4	a + b + c = __	Sums to 10
5	a + b + c = __ a b +c	Sums to 10

YEAR 1
BLOCK 18

DESCRIPTION: Column Addition, Horizontal and Vertical Format

Level	Type	Notes
1	a + b + c = __ a b +c	Sums to 7
2	a + b + c = __ a b +c	Sums to 10
3	ab + c = __ a + bc = __ ab a + c +bc	Sums to 99 no carry
4	ab + c = __ a + bc = __ ab a + c +bc	Sums to 99 no carry
5	ab ab cd cd + e +ef	Sums to 99 no carry

YEAR 1
BLOCK 19

DESCRIPTION: Subtraction, Minuends to 10, Vertical Format

Level	Type	Notes
1	a -b	Minuends to 6
2	a -b	Minuends to 8
3	ab a -c -b	Minuends to 10
4	a ab -b -c	Minuends 5 to 10
5	a ab -b -c	Minuends 7 to 10

YEAR 1
BLOCK 20

DESCRIPTION: Addition and Subtraction, Sums or Minuends to 10, Vertical Format

Level	Type	Notes
1	a +b a -b	Sums or Minuends to 6
2	a +b a -b	Sums or Minuends to 8
3	a +b a -b	Sums or Minuends 6 to 10
4	a +b a -b	Sums or Facts 7 to 10
5	a +b a -b	Sums or Minuends 8 to 10

YEAR 1
BLOCK 21

DESCRIPTION: Inequalities; Addition, and Subtraction, Horizontal Format

In all levels all problems are of the form:
ENTER < OR = OR >
Type (a) a + b __ c + d
Type (b) a + b __ c - d
Type (c) a - c __ c + d
Type (d) a - b __ c - d

Level	Type	Notes
1	a, b, c, and d	Sums or Minuends to 6
2	a, b, c, and d	Sums or Minuends to 8
3	a, b, c, and d	Sums or Minuends 5 to 10
4	a, b, c, and d	Sums or Minuends 6 to 10
5	a, b, c, and d	Sums or Minuends 7 to 10

YEAR 1
BLOCK 22

DESCRIPTION: Addition, Sums to 10, Horizontal Format

Level	Type	Notes
1	a + b = c + __	Sums to 6
2	a + b = c + __	Sums to 8
3	a + b = c + __	Sums to 10
4	a + b = c + __ a + b = __ + d	Sums to 10
5	a + b = c + __ a + b = __ + d	Sums to 10

YEAR 1
BLOCK 23

DESCRIPTION: Addition, Sums to 10, Horizontal Format, With Variables

Level	Type	Notes
1	a + b = c + K K = __	Sums to 6
2	a + b = c + K K = __	Sums to 8
3	a + b = c + K K = __	Sums to 10
4	a + b = c + K K = __ a + b = K + d K + __	Sums to 10
5	a + b = c + K K = __ a + b = K + d K = __	Sums to 10

DESCRIPTION: Special Mixed Drills on Addition and Subtraction

30 problems per main lesson or test

Level	Type	Notes
1	a + b = __ a - b = __	Sums or Minuends to 10
2	a + b = __ a + __ = c __ + b = c a - __ = c __ - b = c	Sums or Minuends to 10
3	a + b = c + __ a + b = __ + d a - b = c - __ a - b = __ - d	Sums or Minuends to 10
4	a + b = K K = __ a - b = K K = __	Sums or Minuends to 10
5	a + b = c + __ a + b = __ + d a - b = c - __ a - b = __ - d	Sums or Minuends to 10

SUMMARY - YEAR 2

BLOCK	DESCRIPTION
1	Addition, Sums to 10, Horizontal Format
2	Subtraction, Minuends to 10, Horizontal Format
3	Mixed Addition and Subtraction, Sums or Minuends to 10, Vertical Format
4	Addition, Sums to 10, Horizontal and Vertical Format
5	Mixed Addition and Subtraction, Sums or Minuends to 10, Horizontal and Vertical Format
6	Counting by One's and Two's, Inequalities
7	Addition, Sums to 13, Horizontal and Vertical Format
8	Subtraction, Minuends to 13, Horizontal and Vertical Format
9	Addition and Subtraction, Facts or Minuends to 13, Horizontal and Vertical Format
10	Units of Inequalities, Counting, Measure (Clock Time, Coins-pennies, nickels, dimes)
11	Addition, Sums to 16, Horizontal and Vertical Format
12	Subtraction, Minuends to 16, Horizontal and Vertical Format
13	Addition and Subtraction, Facts or Minuends to 16, Horizontal and Vertical Format
14	Units of Inequalities, Counting, Measure (Clock Time, Coins-pennies, nickels, dimes)
15	Fractions, 1/2, 1/3, 1/4
16	Addition: Sums to 19, Horizontal and Vertical Format
17	Subtraction, Minuends to 19, Horizontal and Vertical Format
18	Addition and Subtraction, Sums or Minuends to 19, Horizontal and Vertical Format, Carry or Borrow Allowed
19	Measure, Counting, Inequalities
20	Multiplication, Products to 24, Horizontal and Vertical Format
21	Commutative and Associative Laws as Applied to Addition, Subtraction
22	Mixed Drill: Fractions, Measure, Inequalities
23	Mixed Drill: Add, Subtract, Multiply, Vertical and Horizontal Format
24	Special Mixed Drills on Addition and Subtraction

10 problems per main lesson
**5 to 6 problems per review lesson*
16 problems per main test
**8 to 10 problems per review test*

**Some blocks have more problems on review lessons or tests to insure adequate practice or testing.*

YEAR 2
BLOCK 1

DESCRIPTION: Addition, Sums to 10, Horizontal Format

Level	Type	Notes
1	a + b = __	Sums to 6
2	a + b = __	Sums to 7
3	a + b = __	Sums to 10
4	a + b + __ a + __ = c __ + b = c	Sums to 10
5	a + b = c + __ a + b = __ + d	Sums to 10

DESCRIPTION: Subtraction, Minuends to 10, Horizontal Format

Level	Type	Notes
1	a - b = __	Minuends to 6
2	a - b = __	Minuends to 7
3	a - b = __	Minuends to 10
4	a - __ = c __ - b = c	Minuends to 10
5	a - b = c - __ a - b = __ - d	Minuends to 10

YEAR 2

BLOCK 3

DESCRIPTION: Mixed Addition and Subtraction, Sums or Minuends to 10, Vertical Format

Level	Type	Notes
1	a +b	Sums to 5
	a -b	Minuends to 3
2	a +b	Sums to 8
	a -b	Minuends to 6
3	a +b	Sums to 10
	a -b	Minuends to 10
4	a +b	Sums to 10
	a -b	Minuends to 10
5	a +b	Sums to 10
	a -b	Minuends to 10

YEAR 2
BLOCK 4

DESCRIPTION: Addition, Sums to 10, Horizontal and Vertical Format

Level	Type	Notes
1	a + b = __	Sums to 6
	a +b a + b = K K = __	
2	a + b = __	Sums to 8
	a +b a + b = K K = __	
3	a + b = __	Sums to 10
	a +b a + b = K K = __	
4	a + __ = c or __ + b = c	Sums to 10
	a +b a + K = b K = __ or K + b = c K = __	

YEAR 2
BLOCK 4 (Cont'd)

Level	Type	Notes
5	$a + b = c + __$ or $a + b = __ + d$	Sums to 10

$$\begin{array}{r} a \\ +b \\ \hline \end{array}$$

$$\left.\begin{array}{r} a + b = c + K \\ K = __ \end{array}\right\} \text{or} \left\{\begin{array}{r} a + b = K + d \\ K = __ \end{array}\right.$$

YEAR 2
BLOCK 5

DESCRIPTION: Mixed Addition and Subtraction, Sums or Minuends to 10, Horizontal and Vertical Format

Level	Type	Notes
1	a + b = ___	Sums or minuends to 6
	a - b = ___	
	a +b	a -b
	a + b = K	
	K = ___	
	a - b = K	
	K = ___	
2	a + b = ___	Sums or minuends to 8
	a - b = ___	
	a +b	a -b
	a + b = K	
	K = ___	
	a - b = K	
	K = ___	
3	a + b = ___	Sums or minuends to 10
	a - b = ___	
	a +b	a -b
	a + b = K	
	K = ___	
	a - b = K	
	K = ___	

YEAR 2

BLOCK 5 (Cont'd)

Level	Type	Notes
4	$a + __ = c$ or $__ + b = c$ $a - __ = c$ or $__ - b - c$ $\begin{matrix} a \\ \underline{+b} \end{matrix}$ $\quad$ $\begin{matrix} a \\ \underline{-b} \end{matrix}$ $\left.\begin{matrix} a + K = c \\ K = __ \end{matrix}\right\}$ or $\begin{cases} K + b = c \\ K = __ \end{cases}$ $\left.\begin{matrix} a - K = c \\ K = __ \end{matrix}\right\}$ or $\begin{cases} K - b = c \\ K = __ \end{cases}$	Sums or minuends to 10
5	$a + b = c + __$ or $a + b = __ + d$ $a - b = c - __$ or $a - b = __ - d$ $\begin{matrix} a \\ \underline{+b} \end{matrix}$ $\quad$ $\begin{matrix} a \\ \underline{-b} \end{matrix}$ $\left.\begin{matrix} a + b = c + K \\ K = __ \end{matrix}\right\}$ or $\begin{cases} a + b = K + d \\ K = __ \end{cases}$ $\left.\begin{matrix} a - b = c + K \\ K = __ \end{matrix}\right\}$ or $\begin{cases} a - b = K - d \\ K = __ \end{cases}$	Sums or minuends to 10

YEAR 2
BLOCK 6

DESCRIPTION: Counting by One's and Two's, Inequalities

Levels	Type		Notes
1	Type (a)	Find the missing number...	(nos. to 50, counting by 1's)
	Type (b)	Which number comes after a? Is it (a-1)?	
	Type (c)	Which number comes before a? Is it (a-1) or (a+1)?	
	Type (d)	ENTER < OR > a - b	(nos. to 50)
2	Type (a)		Counting by ones
	Type (b) and type (c)		without second line
	Type (d)		
3	Type (a)		Counting by one's and two's
	Type (b) and type (c)		without second line
	Type (b) and type (c)		where second line has two numbers that are <u>not</u> immediately adjacent to given number.
	Type (d)		

YEAR 2

BLOCK 6 (cont'd)

Level	Type	Notes
4	Type (a)	Counting by one's and two's
	Type (e) ENTER < OR = OR > a - b	
	Type (f) ENTER < OR = OR > a - b + c	Sums to 20
	Type (d)	
5	Type (a)	Counting by one's, two's and three's.
	Type (e) ENTER < OR = OR > a - b	
	Type (f) ENTER < OR = OR > a - b + c	Sums to 20

YEAR 2
BLOCK 7

DESCRIPTION: Addition, Sums to 13, Horizontal and Vertical Format

Level	Type	Notes
1	a + b = __ a +b	Sums to 8
2	a + b = __ a +b	Sums to 10
3	a + b = __ a +b	Sums 11 to 13
4	a + __ = c __ + b = c a +b	Sums 11 to 13
5	a + b = c + __ a + b = __ + d a + b + c = __ a +b	Sums 11 to 13

YEAR 2

BLOCK 8

DESCRIPTION: Subtraction, Minuends to 13, Horizontal and Vertical Format

Level	Type	Notes
1	a - b = __ a -b	Minuends to 8
2	a - b = __ a -b	Minuends 7 to 10
3	a - b = __ a -b	Minuends 10 to 13
4	a - __ = c __ - b = c a -b	Minuends 10 to 13
5	a - __ = c __ - b = c a -b	Minuends 10 to 13

YEAR 2
BLOCK 9

DESCRIPTION: Addition and Subtraction, Facts or Minuends to 13, Horizontal and Vertical Format

Level	Type	Notes
1	a + b = __ a - b = __ a +b / a -b	Sums or minuends to 8
2	a + b = __ a - b = __ a +b / a -b	Sums or minuends to 13
3	a + b = __ a - b = __ a +b / a -b	Sums or minuends to 13
4	a + __ = c __ + b = c a - __ = c __ - b = c a +b / ab -c	Sums or minuends to 13
5	a + b = c + __ a + b = __ + d a + b + c = __ a +b / ab -c	Sums or minuends to 13

YEAR 2
BLOCK 10

DESCRIPTION: Units of Inequalities, Counting, Measure (Clock Time, Coins-pennies, nickels, dimes)

Level	Type
1	Inequalities (sums to 10), counting to 50
2	Inequalities (sums to 10), counting to 100
3	Inequalities (sums to 13), counting to 150
4	Inequalities (sums to 13), counting to 200
5	Inequalities (sums to 13), counting to 200

YEAR 2
BLOCK 11

DESCRIPTION: Addition, Sums to 16, Horizontal and Vertical Format

Level	Type	Notes
1	a + b = __ a +b	Sums 7 to 10
2	a + b = __ a +b	Sums 8 to 13
3	a + b = __ a +b	Sums 11 to 16
4	a + __ = c __ + b = c a +b	Sums 11 to 16
5	a + b = c + __ a + b = __ + d a + b + c = __ a +b	Sums to 16

YEAR 2
BLOCK 12

DESCRIPTION: Subtraction, Minuends to 16, Horizontal and Vertical Format

Level	Type	Notes
1	a - b = __ a -b	Minuends to 10
2	a - b = __ a -b	Minuends to 13
3	a - b = __ a -b	Minuends to 16
4	a - __ = c __ - b = c a -b	Minuends to 16
5	a - __ = c __ - b = c a -b	Minuends to 16

YEAR 2
BLOCK 13

DESCRIPTION: Addition and Subtraction, Facts or Minuends to 16, Horizontal and Vertical Format

Level	Type	Notes
1	a + b = __ a - b = __ a +b a -b	Sums or minuends 6 to 10
2	a + b = __ a - b = __ a +b a -b	Sums or minuends 11 to 13
3	a + b = __ a - b = __ a +b a -b	Sums or minuends 12 to 16
4	a + __ = c __ + b = c a - __ = c __ - b = c a +b a -b	Sums or minuends to 16
5	a + b = c + __ a + b = __ + d a + b + c = __ a +b a -b	Sums or minuends to 16

YEAR 2
BLOCK 14

DESCRIPTION: Units of Inequalities, Counting, Measure (Clock Time, Coins-pennies, nickels, dimes)

Levels	Type
1	Inequalities (sums to 10, no regrouping), counting to 100
2	Inequalities (sums to 10, no regrouping), counting to 200
3	Inequalities (sums to 20, no regrouping), counting to 200
4	Inequalities (sums to 20, half regrouping), counting to 200
5	Inequaltities (sums to 20, half regrouping), counting to 300

DESCRIPTION: Fractions, Half, One-third, One-fourth

Several types of problems are presented at all levels. They are as follows:

Type

(1) HOW MANY EQUAL ROWS ...

X X X

X X X

X X X

___ EQUAL ROWS

(2) LOOK AT THE X's

X X

X X

X X

1/3 OF THE X's = __

(3) 1/b + 1/b + 1/b + . . . = __ or

= __ /b

(4) HOW MANY 1/b's = 1 (or 2 or a/b)

YEAR 2
BLOCK 16

DESCRIPTION: Addition: Sums to 19, Horizontal and Vertical Format

Level	Type	Notes
1	a + b = __ a +b	Sums 8 to 13
2	a + b = __ a +b	Sums 10 to 16
3	a + b = __ a +b	Sums 12 to 19
4	a + __ = c __ + b = c a +b	Sums 12 to 19
5	a + b = c + __ a + b = __ + d a + b + c = __ a +b	Sums 12 to 19

YEAR 2
BLOCK 17

DESCRIPTION: Subtraction, Minuends to 19, Horizontal and Vertical Format

Level	Type	Notes
1	a - b = __ a -b	Minuends 8 to 13
2	a - b = __ a -b	Minuends 10 to 16
3	a - b = __ a -b	Minuends 12 to 19
4	a - b = __ a - __ = c __ - b = c a -b	Minuends 12 to 19
5	a - b = __ a - __ = c __ - b = c a -b	Minuends 14 to 19

YEAR 2

BLOCK 18

DESCRIPTION: Addition and Subtraction, Sums or Minuends to 19, Horizontal and Vertical Format, Carry or Borrow Allowed

Level	Type	Notes
1	a + b = __ a - b = __ a a +b -b	Sums or minuends 11 to 13
2	a + b = __ a - b = __ a a +b -b	Sums or minuends 13 to 16
3	a + b = __ a - b = __ a a +b -b	Sums or minuends 15 to 19
4	a + __ = c __ + b = c __ - b = c a a +b -b	Sums or minuends 15 to 19
5	a + b = c + __ a + b = __ + d a + b + c = __ a a -b +b	Sums or minuends 15 to 19

YEAR 2
BLOCK 19

DESCRIPTION: Measure, Counting, Inequalities

Measure: Coins, Time-Hour, Minutes, Length-Feet, Inches
Counting
Inequalities: Addition

Level	Type
1	Inequalities, sums to 10 with no carry, count to 100
2	Inequalities, sums to 20 with no carry, count to 200
3	Inequaltities, sums to 20 half with carry, count to 500
4	Inequaltities, sums to 20 with carry, count to 500
5	Inequalities, sums to 50 with carry, count to 500

YEAR 2
BLOCK 20

DESCRIPTION: Multiplication, Products to 24, Horizontal and Vertical Format

Level	Type	Notes
1	a x b = b x __	Products 0 to 12
2	a x b = __ a x b = b x __	Products 0 to 12
3	a x b = __ a xb a x b = b x __	Products 0 to 12
4	a xb a x b = b x a a x b = __	Products 0 to 12 Random blank
5	a x b = __ a xb a x b = b x a	Products 8 to 24 Random blank

YEAR 2
BLOCK 21

DESCRIPTION: Commutative and Associative Laws as Applied to Addition, Subtraction

All levels are concerned with the use and application of the commutative, associative, and distributive laws in addition and subtraction only.

YEAR 2

BLOCK 22

DESCRIPTION: Mixed Drill: Fractions, Measure, Inequalities

FRACTIONS: Several types of fraction problems are presented at all levels. They are as follows:

(1) HOW MANY EQUAL ROWS . . .

X X X
X X X
X X X

___ EQUAL ROWS

(2) LOOK AT THE X's

X X
X X
X X

1/3 OF THE X's = ___

(3) 1/b + 1/b + 1/b + . . . = ___ or
= ___ /b

(4) HOW MANY 1/b's = 1 (or 2 or a/b)

Measure: Coins-Time:hr-mins-Length:ft-inches

Inequalities: Level 1: Sums or minuends 11 → 13
Level 2: Sums or minuends 13 → 16
Level 3: Sums or minuends 14 → 19
Level 4: Sums or minuends 15 → 19
Level 5: Sums or minuends 16 → 19

YEAR 2
BLOCK 23

DESCRIPTION: Mixed Drill: Add, Subtract, Multiply, Vertical and Horizontal Format

Level	Type	Notes
1	a c +b -a a x b = b x __	Sums or minuends 10 to 13 Products 0 to 12
2	a c +b -a a xb	Sums or minuends 13 to 16 Products 0 to 12
3	a c +b -a a xb a x b = __	Sums or minuends 13 to 19 Products 0 to 12
4	a c +b -a a xb a x b = __	Sums or minuends 14 to 19 Products 0 to 12
5	a c +b -a a xb a x b = __	Sums or minuends 15 to 19 Products 8 to 24

YEAR 2

BLOCK 24

DESCRIPTION: Special Mixed Drills on Addition and Subtraction

30 problems per main lesson or main test, sums or minuends to 18

Level	Type
1	a + b = __
	a - b = __
2	a + b = __
	a + __ = c
	__ + b = c
	a - __ = c
	__ - b = c
3	a + b = c + __
	a + b = __ + d
4	a + b = K
	K = __
	a - b = K
	K = __
5	a + b = c + __
	a - b = c - __
	a + b = __ + d
	a - b = __ - d

SUMMARY - YEAR 3

BLOCK	DESCRIPTION
1	Mixed Addition and Subtraction, Sums or Minuends to 40, Horizontal Format
2	Addition, Sums to 40, Horizontal and Vertical Format
3	Subtraction, Minuends to 40, Horizontal and Vertical Format
4	Addition, Sums to 999, Vertical Format
5	Subtraction, Minuends 10 to 999 at all levels, Vertical Format
6	Addition, Vertical Format
7	Subtraction, Vertical Format
8	Mixed Addition and Subtraction, Vertical Format
9	Measure, Inequalities
10	Addition and Subtraction, Vertical Format
11	Units of Measure and Inequalities
12	Multiplication, Horizontal Format
13	Mixed Multiplication and Division, Horizontal Format
14	Division, Ladder Format
15	Commutative, Associative and Distributive Laws
16	Mixed drills: Measure (With Inequalities)
17	Fractions
18	Multiplication: Two Through Nine, Horizontal Format
19	Mixed Drills Covering Multiplication, Division, and Fractions
20	Division, Ladder Format
21	Multiplication, Vertical Format
22	Mixed Drill: Addition and Subtraction, Vertical Format Multiplication, Horizontal Format Division, Ladder Format (no remainder)
23	Commutative, Associative, and Distributive Laws as Applied to Addition, Subtraction, and Multiplication
24	Special Mixed Drills on Addition and Subtraction

14 problems per main lesson
**7 to 9 problems per review lesson*
**20 problems per main test*
**10 to 12 problems per review test*

*Some blocks have a greater number of problems to insure adequate practice or testing. Also, blocks with ladder division have fewer problems because of the several answers required during ladder division.

YEAR 3

BLOCK 1

DESCRIPTION: Mixed Addition and Subtraction, Sums or Minuends to 40, Horizontal Format

Level	Type	Notes
1	a + b = __ a - b = __	Sums or minuends 0 to 9
2	a + __ = c a + b = __ ab - c = __	Sums or minuends 10 to 18
3	ab + c = __ a + bc = __ ab - c = __	Sums or minuends 10 to 40, no carry or borrow
4	ab + __ = de __ + bc = de ab + cd = __ __ - b = c a - __ = c ab - c = __	Sums or minuends 10 to 40, no carry or borrow
5	ab + c = __ ab + __ = ef __ - c = de a + __ = de ab - __ = de	Sums or Minuends 10 to 40 some carry or borrow

YEAR 3
BLOCK 2

DESCRIPTION: Addition, Sums to 40, Horizontal and Vertical Format

Level	Type	Notes
1	a + b = __ a +b	Sums 0 to 9
2	a + b = __ a +b	Sums 10 to 18
3	ab + c = __ a + bc = __ a + __ = c __ + b = c ab a +c +bc	Sums 10 to 40, no carry
4	ab + __ = de __ + bc = ed ab + cd = __ ab +cd	Sums 10 to 40, no carry
5	ab + c = __ a + bc = __ __ + cd = ef ab + __ = ef ab ab a +cd + c +bc	Sums 10 to 40, some carry

YEAR 3
BLOCK 3

DESCRIPTION: Subtraction, Minuends to 40, Horizontal and Vertical Format

Level	Type	Notes
1	a - b = __ a -b	Minuends 0 to 9
2	a - b = __ ab - c = __ a ab -b -c	Minuends to 0 to 18
3	ab - c = __ ab -c	Minuends 0 to 25
4	a - __ = c __ - b = c ab - c = __ ab -c	Minuends 0 to 40, no borrow
5	ab - __ = de __ - c = de ab -cd	Minuends 10 to 40, no borrow

YEAR 3
BLOCK 4

DESCRIPTION: Addition, Sums to 999, Vertical Format

Level	Type	Notes
1	a +b; ab +c; a +bc	No carry
2	a +b; ab +c; a +bc; ab +cd	No carry
3	ab +cd; abc +de; abc +def	No carry
4	ab +cd; abc +de; ab cd +ef	No carry
5	abc +de; abc +def; ab cd +ef; ab +cd; abc +de	Carry to 10's place

YEAR 3

BLOCK 5

DESCRIPTION: Subtraction, Minuends 10 to 999 at all levels, Vertical Format

Level	Type	Notes
1	ab -c ab -cd	No borrow
2	ab -c ab -cd abc -de	No borrow
3	ab -cd abc -de abc -def	No borrow
4	abc -de abc -def	No borrow
	ab -c ab -cd abc -de abc -def	Borrow from 10's place
5	abc -de abc -def	No borrow
	ab -c ab -cd abc -de abc -def	Borrow from 10's place

DESCRIPTION: Addition, Vertical Format

Level	Type	Notes
1	a ab b +c +c	No carry, sums to 30
	ab a +cd +bc	
2	a ab b ab a +c +c +cd +bc	No carry, sums to 30
	ab abc cd +def +ef	No carry
3	ab abc cd +def +ef	No carry
	ab a abc ab +c +bc +def +cd	Carry to 10's place
4	ab abc cd +def +ef	No carry
	ab a abc ab +c +bc +def +cd	Carry to 10's place
5	ab abc cd +def +ef	No carry
	ab ab abc cd +cd +def +ef	Carry to 100's and/or 10's place

YEAR 3
BLOCK 7

Description: Subtraction, Vertical Format

Level	Type	Notes
1	$\begin{array}{r} ab \\ -c \end{array}$ (a = 1)	Minuends 10 to 19
2	$\begin{array}{r} ab \\ -c \end{array}$ (a = 1)	Minuends 11 to 99
	$\begin{array}{r} ab \\ -cd \end{array}$ (b>d)	
3	$\begin{array}{r} ab \\ -c \end{array}$ (a = 1)	Minuends 11 to 99
	$\begin{array}{r} ab \\ -c \end{array}$ (b<c)	
	$\begin{array}{r} ab \\ -cd \end{array}$ (b ≥ d)	
4	$\begin{array}{r} ab \\ -cd \end{array}$ (b ≥ d)	Minuends 11 to 99
	$\begin{array}{r} ab \\ -c \end{array}$ (b<c)	
	$\begin{array}{r} ab \\ -cd \end{array}$ (b < d)	
5	$\begin{array}{r} ab \\ -c \end{array}$ (b < c)	Minuends 11 to 99
	$\begin{array}{r} ab \\ -cd \end{array}$ (b<d)	

YEAR 3
BLOCK 8

DESCRIPTION: Mixed Addition and Subtraction, Vertical Format

Level	Type	Notes
I	a ab b a +c +c +bc ab -c	No carry, and (a = 1)
2	ab abc cd +def +ef ab -cd	No carry and (b ≥ d)
3	ab a +c +bc ab -c	Carry to 10's place and (b < c)
4	ab abc -cd +def ab -cd	Carry to 10's place and (b < d)
5	ab abc cd ab +def +ef +cd ab ab -c -cd	Carry to 10's or 100's place and (b < c and b < d)

YEAR 3

BLOCK 9

DESCRIPTION: Measure, Inequalities

Measure: Length (feet, inches, yards)
Weight (pounds, ounces)
Time (hours, minutes)
Quantity (dozen)

Inequalities: addition and subtraction

ENTER < OR = OR >

Level	Type	Notes
1	a + b __ c a - b __ c	Sums or minuends 0 to 10
2	a + b __ c + d a - b __ c - d	Sums or minuends 0 to 18
3	ab + c __ de ab - c __ de ab - c __ d ab - cd __ e	Sums or minuends 10 to 20
4	ab + c __ de + f ab - c __ de - f	Sums or minuends 10 to 99
5	ab + cd __ ef ab - cd __ ef	Sums or minuends 10 to 99

DESCRIPTION: Addition and Subtraction, Vertical Format

Level	Type	Notes
1	ab +c; a +bc; ab +cd	No carry
	ab -c; ab -cd	No borrow
2	bc +a; a +bc	Carry to 10's place
	ab +cd	No carry
	ab -c	Borrow from 10's place
	ab -cd	No borrow
3	ab +c; a +bc; ab +cd	Carry to 10's place
	ab -c; ab -cd	Borrow from 10's place
4	a b +c; abc +def; ab +cd	Carry to 10's place
	ab -c; ab -cd; abc -def	Borrow from 10's place
5	ab cd +ef; abc +def; ab +cd	Carry to 10's or 100's place
	ab -cd; abc -def	Borrow from 10's place

YEAR 3
BLOCK 11

DESCRIPTION: Units of Measure and Inequalities

Units of Measure: Money (dollar, penny, nickel, dime, quarter)
Length (feet, inches, yards)
Time (hours, minutes)
Weight (pounds, ounces)
Quantity (dozen)

Inequalities: Compare measures and enter < OR = OR >

Level	Type	Notes
1	a + b __ c a - b __ c	Sums or minuends to 10
2	a + b __ c + d a - b __ c - d	Sums or minuends to 20
3	ab + c __ de ab - cd __ e ab - c __ d ab - c __ de	Sums or minuends to 30
4	ab + c __ de + f ab - c __ de - f	Sums or Minuends 10 to 99
5	ab + cd __ ef ab - c __ ef ab - cd __ ef	Sums or Minuends 10 to 99

YEAR 3
BLOCK 12

DESCRIPTION: Multiplication, Horizontal Format

Level	Type	Notes
1	a x b = __	Products range from 0 to 12
2	a x b = __	Products range from 8 to 24
3	a x b = __	Products range from 12 to 35
4	a x b = __ a x __ = c __ x b = c	Products range from 12 to 35
5	a x b = __ a x __ = c __ x b = c	Products range from 20 to 64

YEAR 3

BLOCK 13

DESCRIPTION: Mixed Multiplication and Division, Horizontal Format

Level	Type	Notes
1	a x b = __ c / a = __	Products from 0 to 12
2	a x b = __ c / a = __	Products from 8 to 24
3	a x b = __ c / a = __	Products from 12 to 35
4	a x b = __ a x __ = c __ x b = c c / a = __ c / __ = b __ / a = b	Products from 12 to 35
5	a x b = __ a x __ = c __ x b = c c / a = __ c / __ = b __ / a = b	Products from 20 to 64

YEAR 3
BLOCK 14

DESCRIPTION: Division, Ladder Format

Level	Type	Notes
1	$a/\overline{b}$ $a/\overline{bc}$	Dividends 2 to 12 a = 1 to 9
2	$a/\overline{b}$ $a/\overline{bc}$	Dividends 2 to 20 a = 1 to 9
3	$a/\overline{b}$ $a/\overline{bc}$	Dividends 4 to 21 a - 1 to 9
4	$a/\overline{b}$ $a/\overline{bc}$	Dividends 8 to 25 a = 1 to 9
5	$a/\overline{bc}$	Dividends 16 to 30 a = 2 to 9

YEAR 3
BLOCK 15

DESCRIPTION: Commutative, Associative and Distributive Laws

All five levels are concerned with the use and application of the commutative, associative and distributive laws for addition and subtraction, in addition, levels 4 and 5 have some problems using multiplication.

YEAR 3
BLOCK 16

DESCRIPTION: Mixed drills: Measure (with inequalities)

Money	-	cents, nickels, dimes, quarters, halves
Length	-	inches, feet yards
Time	-	(clock: sec., min., hrs., calendar)
Weight	-	oz., lbs., tons
Liquid measure	-	cups, pints, quarts, gals.
Quantity	-	(dozen)

YFAR 3
BLOCK 17

DESCRIPTION: Fractions

Level	Type	Notes
1	"THE LETTER M IS GIVEN __ TIMES" 1/k OF m = __ Inequalities	
2	"THE LETTER M IS GIVEN __ TIMES" x/k OF m = __ Inequalities	
3	"THE LETTER M IS GIVEN __ TIMES" x/k OF m = __ Inequalities a/b = __/b a/b + c/b = __/b c/b - a/b = __/b	
4	"THE LETTER M IS GIVEN __ TIMES" x/k OF m = __ Inequalities a/b + c/b = __/ __ c/b - a/b = __/ __	
5	x/k OF m = __ a/b = __/d a/b + c/b = __/ __ c/b - a/b = __/ __	

YEAR 3
BLOCK 18

DESCRIPTION: Multiplication: Two through Nine, Horizontal Format

Level	Type	Notes
1	a x b = __	Products 8 to 24
2	a x b = __	Products 12 to 35
3	a x b = __	Products 20 to 64
4	a x b = __ a x __ = c __ x b = c	Products 20 to 64
5	a x b = __ a x __ = c __ x b = c	Products 27 to 81

YEAR 3
BLOCK 19

DESCRIPTION: Mixed Drills Covering Multiplication, Division, and Fractions

Each problem consists of three parts, sequenced in the following way:

(1) a x __ = c
(2) c/a = __
(3) 1/a of c = __

Level	Type	Notes
1	a x __ = c c/a = __ 1/a of c = __	Products 0 to 12
2	a = __ = c c/a = __ 1/a of c = __	Products 8 to 24
3	Random blank in all	Products 12 to 35
4	Random blank in all	Products 20 to 64
5	Random blank in all	Products 27 to 81

YEAR 3
BLOCK 20

DESCRIPTION: Division, Ladder Format

No zeros in quotient, no remainders
Blank on right for levels 1,2,3.
Random position for levels 4, 5.

Level	Type	Notes
1	$a/\overline{b}$ $a/\overline{bc}$	One step problem, dividends 4 to 30, a = 1 to 9
2	$a/\overline{bc}$	One step problem dividends 27 to 81 a = 2 to 9
3	$a/\overline{bc}$	One step problem dividends 10 to 99 a = 1 to 6
4	$a/\overline{bcd}$	Two step problems, no carries dividends 100 to 999 a = 2 to 6
5	$a/\overline{bcd}$	Two and three step problems, no carries dividends 100 to 999 a = 2 to 6

YEAR 3
BLOCK 21

DESCRIPTION: Multiplication, Vertical Format

Level	Type	Notes
1	b x a	Products 0 to 30
2	b x a	Products 27 to 81
3	ab x c	Multipliers 2 to 6
4	ab x c	Multipliers 4 to 8
5	ab x c	Multipliers 5 to 9

YEAR 3
BLOCK 22

DESCRIPTION: Mixed Drill: Addition and Subtraction, Vertical Format
Multiplication, Horizontal Format
Division, Ladder Format (no remainder)

Number of problems varies with level.

Level	Type	Notes
1	Add and Subtract:	No regrouping
	ab +c a +bc ab +cd ab -c cd -ab	
	Multiply: a x b = __	Products 8 to 24
	Divide: a/b a/bc	Dividends 4 to 30
		One step problems
		blank on right
		no zeros
		a = 1 to 9
2	Add and Subtract:	
	ab +c a +bc ab -c	Regrouping in 10's place
	ab -cd cd -ab	No regrouping
	Multiply: a x b = __	Products 12 to 35
	Divide: a/bc	Dividends 20 to 64
		One step problem
		blank on right
		no zeros
		a = 2 to 9

YEAR 3
BLOCK 22 (Cont'd)

Level	Type	Notes
3	Add and Subtract: ab +c a +bc ab +cd ab -c cd -ad Multiply: a x b = __ Divide: a/bc	Regrouping in 10's place Products 12 to 35 Dividends 27 to 81 One step problems blank on right no zeros a = 2 to 4
4	Add and Subtract: a b +c abc +def ab +cd ab -c cd -ab def -abc Multiple: a x b = __ a x __=c __x=c Divide: a/bcd	Regrouping in 10's place Products 20 to 64 Dividends 100 to 999, or 2 to 6. Some two and three problems no zeros random blank

Level	Type	Notes
5	Add and Subtract ab cd abc ab cd def +ef +def +cd -ab -abc	Regrouping in 10's place
	Multiply: a x b = __ a x __ = c __ x b = c	Products 27 to 81
	Divide: a/$\overline{bcd}$	Dividends 100 to 999 Some zeros in quotient random blank some two and three step problems a = 2 to 9

YEAR 3
BLOCK 23

DESCRIPTION: Commutative, Associative, and Distributive Laws as Applied to Addition, Subtraction, and Multiplication

All five levels of the block are concerned with the use and application of the CAD Laws for addition, subtraction, and multiplication

YEAR 3
BLOCK 24

DESCRIPTION: Special Mixed Drills on Addition and Subtraction

Thirty problems per main lesson or main test.

Level	Type	Notes
1	a + b = __ a - b = __	Sums or minuends to 20
2	a + b = __ a + __ = c __ + b = c a - __ = c __ - b = c	Sums or minuends to 20
3	a + b = c + __ a - b = c - __	Sums or minuends to 20
4	a + b = K K = __ a - b = K K = __	Sums or minuends to 20
5	a + b = c + a - b = c - __ a + b = __ + d a - b = __ - d	Sums or minuends to 20

SUMMARY - YEAR 4

BLOCK	DESCRIPTION
1	Addition, Horizontal and Vertical
2	Subtraction, Horizontal and Vertical Format
3	Subtraction, Vertical Format, Two-and Three-Digit
4	Addition, Two-and Three-Digit Addends
5	Addition and Subtraction, Vertical Format
6	Units of Measure
7	Multiplication, Two through Nine, Horizontal Format
8	Addition, Subtraction, and Multiplication - Addition and Subtraction are in Vertical Format, Multiplication is in Horizontal Format
9	CAD Laws
10	Division, Ladder Format, One-Digit Divisors; One-Digit Quotients
11	Multiplication: Products to 144, Horizontal Format
12	Fractions: Recognizing the Fractional Part of a Quantity; Recognizing the relationships, <, =, > between two fractions.
13	Mixed Drill: Multiplication, Division, Fractions (Including Inequalities)
14	Division, Ladder Format, 1, 2, and 3 Step Problems. Random Blank Position
15	CAD Laws
16	Fractions, Recognition, Changing Terms, Add, Subtract
17	Units of Measure
18	Multiplication and Division Involving Numbers that are Multiples of 10
19	Multiplication, Division (Ladder Format) Fractions, CAD Laws
20	Division, Ladder Format
21	Fractions: Recognizing, Reducing, Inequalities, Adding and Subtracting
22	Mixed Drill, Long Division, Fractions
23	Entering Quotient in Division, Ladder Format: Student gives Quotient Figures only, Random Blank
24	Special Drills on Addition, Subtraction, Multiplication, and Division

14 problems per main lesson
**7 to 9 problems per review lesson*
**20 problems per main test*
**10 to 12 problems per review lesson*

*Some blocks have a greater number of problems to insure adequate practice or testing. Also, blocks with ladder division have fewer problems because of the several answers required during ladder division.

YEAR 4

BLOCK 1

DESCRIPTION: Addition, Horizontal and Vertical Format

Level	Type	Notes
1	a + b = __	Sums 0 to 10
	a +b	Sums 0 to 18
2	a + b = __	Sums 0 to 20
	a +b	Sums 0 to 20
3	a + __ = c	Sums 0 to 20
	__ + b = c	
	ab + c = __	
	ab ab +c +cd	Sums 0 to 99 no carry
4	__ + b = cd	Sums 0 to 90
	ab + cd = __	
	ab + __ = ef	
	ab + c = __	
	ab +cd	Sums 10 to 99, no carry
	ab +c	Sums 10 to 99, carry to 10's place
5	ab + __ = de	Sums 0 to 90
	__ + c de	
	a + b + c = __	
	ab ab a +cd +c +bc	Sums 10 to 99 carry to 10's place

YEAR 4
BLOCK 2

DESCRIPTION: Subtraction, Horizontal and Vertical Format

Level	Type	Notes
1	a - b = __	Minuends to 10
	a -b	No borrow
2	a - b = __	Minuends to 20
	a -b	No borrow
3	ab - __ = d __ - c = d	Minuends to 20 No borrow
	ab -c	Minuends 10 to 99 Borrow and no borrow
4	ab - __ = d ab - c = __	Minuends to 40 No borrow
	ab ab -c -cd	Minuends 10 to 99 Borrow and no borrow
5	ab - c = __	Borrow
	ab - c	Borrow
	abc -de	Borrow 10's or 1's
	ab - __ = c __ - b = c	Borrow 10's and 100's

YEAR 4

BLOCK 3

DESCRIPTION: Subtraction, Vertical Format, Two- and Three-digit

Level	Type	Notes
1	ab -c; ab -cd	No borrow
2	ab -c; ab -cd; abc -def	No borrow
3	abc -def; ab -cd	No borrow and
	ab -c	Borrow from 10's place
4	ab -c; ab -cd; abc -def	Borrow from 10's and/or 100's place
5	ab -c; ab -cd; abc -def	Borrow from10's and/or 100's place

YEAR 4
BLOCK 4

DESCRIPTION: Addition, Two- and Three-digit Addends

Level	Type	Notes
1	ab +c ab +cd	No carry
2	ab +c ab +cd abc +def	No carry
3	ab +cd abc +def	No carry and
	ab +c	Carry to 10's place
4	ab +c ab +cd abc +def	Carry to 10's and/or 100's and/or 1000's place
5	ab +c ab +cd abc +def	Carry to 10's and/or 100's and/or 1000's place

YEAR 4

BLOCK 5

DESCRIPTION: Addition and Subtraction, Vertical Format

Level	Type	Notes
1	ab +c; ab +cd; ab -c; ab -cd	No borrow, No carry
2	ab +c; ab +cd; abc +def; ab -c; ab -cd; abc -def	No borrow, No carry
3	ab +cd; abc +def; ab +c; ab -c; ab -cd; abc -def	Half borrow, Carry (in 10's place)
4	ab +c; ab +cd; abc +def; ab -c; ab -cd; abc -def	Half borrow, Carry (10's place); Half borrow carry (100's place)
5	ab +c; ab +cd; abc +def; ab -c; abc -de; abcd -efg	Borrow, carry-- 2 places (i.e. 10's and 100's 100's and 1000's 10's and 1000's)

DESCRIPTION: Units of Measure

Length:	Inches, feet, yards
Time:	Days, weeks, months
	Hours, minutes, seconds
Weight:	Pounds, ounces
Money:	Coins

Levels 4 and 5 have some problems involving multiple answers.

YEAR 4
BLOCK 7

DESCRIPTION: Multiplication, Two through Nine, Horizontal Format

Level	Type	Notes
1	a x b = __	Products 0 to 12
2	a x b = __	Products 8 to 24
3	a x b = __	Products 12 to 35
4	a x b = c	Products 20 to 64 Random blank
5	a x b = c c = a x b	Products 27 to 81 Random blank

YEAR 4

BLOCK 8

DESCRIPTION: Addition, Subtraction, and Multiplication

Addition and Subtraction are in vertical format
Multiplication is in horizontal format

Level	Type	Notes
1	ab ab -c -cd	No borrow
	ab ab +c +cd	No carry
	a x b = __	Products 0 to 12
2	ab ab abc -c -cd -def	No borrow
	ab ab abc +c +cd +def	
	a x b = __	Products 8 to 24
3	abc ab -def -cd	No borrow
	ab -c	Borrow from 10's place
	ab abc +cd +def	No carry Carry to 10's place
	ab +c	Carry to 10's place
	a x b = __	Products 12 to 35
4	ab ab abc -c -cd -def	Borrow from 10's and/or 100's place
	ab ab abc +c +cd +def	Carry to 10's and/or 100's and/or 1000's place
	a x b = c	Products 20 to 64 Random blank

YEAR 4

BLOCK 8 (Cont'd)

DESCRIPTION: Addition, Subtraction, and Multiplication

Addition and Subtraction are in vertical format
Multiplication is in horizontal format

Level	Type	Notes
5	ab -c; ab -cd; abc -def	Borrow from 10's and/or 100's some zeros in minuend
	ab +c; ab +cd; abc +def	Carry to 10's and/or 100's and/or 1000's place some involve zero
	a x b = c c = a x b	Random blank, products 27 to 81

YEAR 4
BLOCK 9

DESCRIPTION: CAD Laws

All five levels of the blocks are concerned with the application and use of these laws of arithmetic for addition, subtraction, multiplication, and division.

YEAR 4

BLOCK 10

DESCRIPTION: Division, Ladder Format

One-digit divisors; one-digit quotients

Level	Type	Notes
1	Dividends 0 to 24	No remainder blank on right zero quotient allowed
2	Dividends 12 to 36	No remainders blank on right no zeroes
3	Dividends 15 to 45	No remainders blank on right no zeroes
4	Dividends 20 to 64	Half with remainders random blank zeros Half without remainders blank on right no zeroes
5	Dividends 27 to 81	Half with remainder random blank no zeroes Half without remainders blank on right no zeroes

DESCRIPTION: Multiplication: Products to 144, Horizontal Format

Level	Type	Notes
1	a x b = __	Products 12 to 35
2	a x b = __	Products 20 to 64
3	a x b = __	Products 27 to 81
4	a x b = __ a x __ = c __ x b = c	Products 54 to 100
5	a x b __ a x __ = c __ x b = c c = a x __ c = __ x b __ = a x b	Products 72 to 144

YEAR 4

BLOCK 12

DESCRIPTION: Fractions

Recognizing the fractional part of a quantity;
recognizing the relationship <, =, > between two fractions.

Level	Type
1	Recognizing the fractional part of a quantity of up to 10 characters. Denominators of the term are either equal to the given quantity or one-half or one-third of it, i.e., 4/6 OF 6 = __, 1/2 OF 6 = __, etc. Simple inequalities, i.e., 1/2 __ 1/3, etc.
2	Recognizing the fractional part of a quantity. Denominators are factors of the quantity, i.e., 5/8 OF 16 = Simple inequalities, i.e., 1/2 __ 2/4, 2/12 __ 1/2, etc.
3	Fractional parts, i.e., 1/5 of 15 = __, 3/4 of 8 = __. Simple inequalities, i.e., 3/4 __ 7/8, etc.
4	Fractional parts, i.e., 4/12 = 2/__, 16/24 = __/12. Simple inequalities, i.e., 9/12 __ 2/4, 2/3 __ 8/9.
5	Fractional parts, i.e., 4/24 = __/6, 3/5 = 12/__. Simple inequalities, i.e., 3/5 __ 8/10, 5/12 __ 12/24.

DESCRIPTION: Mixed Drill: Multiplication, Division, Fractions (Including Inequalities)

Level	Type	Notes
1	Recognizing the fractional part of a quantity of up to 10 characters. Denominators of the term are either equal to the given quantity or one-half or one-third of it, i.e., 4/6 of 6 = __, 1/2 OF 6 = __, etc. Simple inequalities, i.e., 1/2 __ 1/3, etc.	Products 12 to 35 Dividends 0 to 12
2	Recognizing the fractional part of a quantity. Denominators are factors of the quantity, i.e., 5/8 OF 16 = __. Simple inequalities, i.e., 1/2 __ 2/4, 2/12 __ etc.	Products 20 to 64 Dividends 8 to 24
3	Fractional parts, i.e., 1/5 of 15 = __, 3/4 of 8 __. Simple inequalities, i.e., 3/4 __ 7/8, etc.	Products 27 to 81 Dividends 12 to 35
4	Fractional parts, i.e., 4/12 = 2/__, 16/24 = __/12. Simple inequalities, i.e., 9/12 __ 2/4, 2/3 __ 8/9.	Products 54 to 100 Dividends 20 to 64.
5	Fractional parts, i.e., 4/24 = __/6, 3/5 = 12/__. Simple inequalities, ie.e, 3/5 __ 8/10, 5/12 __ 12/24.	Products 72 to 144 Dividends 27 to 81

YEAR 4

BLOCK 14

DESCRIPTION: Division, Ladder Format, 1,2, and 3 Step Problems

Random blank position.

Level	Type	Notes
1	$a/\overline{bc}$	Dividends 10 to 99 a = 2 to 9 some zeroes no remainders
2	$a/\overline{bcd}$	Dividends 100 to 99 a = 2 to 9 some zeroes no remainders
3	$a/\overline{bcd}$	Dividends 100 to 999 a = 2 to 9 some zeroes some remainders
4	$a/\overline{bcd}$	Dividends 100 to 999 a = 2 to 9 some zeroes some remainders
	$a/\overline{bcde}$	Dividends 1000 to 9999 a = 2 to 9 some zeroes some remainders
5	a/bcde	Dividends 1000 to 999 a = 2 to 9 some zeroes some remainders

YEAR 4
BLOCK 15

DESCRIPTION: CAD Laws

All five levels of this block are concerned with the use and application of these arithmetic laws for addition, subtraction, and division.

YEAR 4
BLOCK 16

DESCRIPTION: Fractions, Recognition, Changing Terms, Add, Subtract

Level	Type
1	Identify Inequalities Add and subtract fractions with like denominators
2	Identify Inequalities Add and subtract fractions with like denominators and reduce to lowest terms
3	Completion (i.e., a/b of c = __) Inequalities Add and subtract fractions with like denominators and reduce to lowest terms
4	Completion (i.e., a/b = __/d, a/b of c = __) Add and subtract fractions with unlike denominators
5	Completion (i.e., a/b = __/d) Add and subtract fractions with unlike denominators and reduce to lowest terms

YEAR 4
BLOCK 17

DESCRIPTION: Units of Measure

Time:	Months, weeks, days
	Hours, minutes, seconds
Money:	Coins
Liquid:	Pint, quart, gallon
Length:	Yards, feet, inches
Weight:	Pounds, ounces

On Level 5, some problems have multiple answers.

YEAR 4
BLOCK 18

DESCRIPTION: Multiplication and Division Involving Numbers that are Multiples of 10

Each drill has problems in two forms:

(1) a x b = __ where a and/or b are multiples of 10

(2) Division ladder format where divisor is a multiple of 10 division (1 to 9) x 10

Level	Notes
1	Products range from 0 to 12 (x 10) Dividends (1 to 24) x 10
2	Products range from 8 to 24 (x 10) Dividends (12 to 36) x 10
3	Products range from 12 to 35 (x 10 or 100) Dividends (15 to 48) x 10
4	Products range from 20 to 64 (x 10 or 100) Dividends (20 to 64 x 10 and (20 to 64) x 100
5	Products range from 27 to 81 (x 10 or 100) With random blank location; Dividends (27 to 81) x 100

YEAR 4
BLOCK 19

DESCRIPTION: Multiplication, Division (Ladder Format), Fractions, CAD Laws

Level	Type	Notes
1	Products 0 to 12 (x 10^n) $a/\overline{bc}$	No remainders
2	Products 8 to 24 (x 10^n) $a/\overline{bcd}$	No remainders 1 step Dividends (10 to 99) x 10 a = 1 to 9
3	Products 12 to 35 (x 10^n) $a/\overline{bcd}$	Random remainders
4	Products 20 to 64 (x 10^n) $a/\overline{bcd}$ $a/\overline{bcde}$	Random remainders some zeroes in quotient
5	Products 27 to 81 (x 10^n) $a/\overline{bcde}$	Random temainders some zeroes in quotient

YEAR 4
BLOCK 20

DESCRIPTION: Division, Ladder Format

Level	Type	Notes
1	$a/\overline{bc}$	No remainders
	10 problems per daily drill	Dividends 10 to 99 a=2 to 9
	5 problems per review drill	Random blank, some zeroes
2	$a/\overline{bc}$ $a/\overline{bcd}$	No remainders
	7 problems per daily drill	Dividends 10 to 999 a=2 to 9
	4 problems per review drill	Blanks on right, some zeroes
3	$ab/\overline{cde}$ (b=e=0)	No remainders
	6 problems per daily drill	Dividends (10 to 99)x 10
	3 problems per review drill	a=(1 to 9)x 10
4	$ab/\overline{cde}$ (b=e=0)	Some remainders Dividends (10 to 99)x 10 a=(1 to 9)x 10 Blanks on right, some zeroes
	$ab/\overline{cde}$	No remainders Dividends (10 to 99)x 10 a=10 to 99 blanks on righ
	$ab/\overline{cde}$	With remainders
	5 problems per daily drill	Dividends (10 to 99)x 10
	3 problems per review drill	a=10 to 99 Random blanks

Level	Type	Notes
5	$ab/\overline{cdef}$ $(b \neq 0)$	Some remainders Dividends (1000 to 9999) a=11 to 99 Random blanks some zeroes
	$ab/\overline{cdef}$ $(b \neq 0)$ 4 problems per daily drill 4 problems per review drill	Some remainders Dividends (100 to 999)x 10 a=11 to 99 Random blanks some zeroes

YEAR 4
BLOCK 21

DESCRIPTION: Fractions: Recognizing, Reducing, Inequalities, Adding and Subtracting

Level	Type
1	Identifying (i.e., a/b of b = __) Inequalities Add and subtract fractions with like denominators, no reducing.
2	Identifying (i.e., a/b of b = __) Inequalities Add and subtract fractions with like denominators, no reducing.
3	Identifying (i.e., a/b of c = __) Inequalities Add and subtract fractions with unlike denominators, no reducing.
4	Completions (i.e., a/b = __/d) Inequalities Add and subtract fractions with unlike denominators, no reducing.
5	Inequalities Add and subtract fractions with unlike denominators and reducing answers to lowest terms.

YEAR 4
BLOCK 22

DESCRIPTION: Mixed Drill, Long Division, Fractions

Level	Type	Notes
1	Division: $a/\overline{bc}$ Fractions: Identifying (i.e., a/b of b = __) Inequalities Add & subtract fractions with like denominators, no reducing.	No remainders Dividends 10 to 99 a=2 to 9 blanks on right
2	Division: $a/\overline{bc}$ $a/\overline{bcd}$ Fractions: Identifying (i.e., 1/a of b = __) Inequalities Add & subtract fractions with like denominators, no reducing.	No remainders Dividends (10 to 999) a=2 to 9 blanks on right
3	Division: $ab/\overline{cde}$ (b=e=0) Fractions: Identifying (i.e., a/b of c = __) Inequalities Add & subtract fractions with unlike denominators, no reducing.	No remainders Dividends (10 to 99) a=(1 to 9)x 10 blanks on right some zeroes

YEAR 4

BLOCK 22 (Cont'd)

Level	Type	Notes
4	Division:	
	$ab/\overline{cde}$ (b=e=0)	No remainders Dividends (10 to 99) a=(1 to 9)x 10
	Fractions:	Blanks on right some zeroes
	Completions (i.e., a/b = __/d)	
	Inequalities	
	Add & subtract fractions with unlike denominators, no reducing.	
5	Division:	
	$ab/\overline{cdef}$ ($b \neq 0$)	Some remainders Dividends (1000 to 9999) a=11 to 99 random blanks
	$ab/\overline{cdef}$ ($b \neq 0$)	Some remainders Dividends (100 to 999) a=11 to 99
	Fractions:	random blanks
	Inequalities	
	Add & subtract fractions with unlike denominators and reducing answers to lowest terms.	

YEAR 4
BLOCK 23

DESCRIPTION: Entering Quotients in Division, Ladder Format:
Student gives quotient figures only, random blank.

Level	Type	Notes
1	$a/\overline{bc}$	No remainders Dividends 10 to 99 One step a = 2 to 9 some zeroes
2	$a/\overline{bc}$ $a/\overline{bcd}$	One quarter with remainders Dividends 100 to 999 a = 2 to 9 no zeroes
3	$a/\overline{bcd}$	Half with remainders Dividends 100 to 999 a = 2 to 9 no zeroes
4	$a/\overline{bcd}$	Half with remainders Dividends 100 to 999 a = 2 to 9 some zeroes
5	$a/\overline{bcd}$	Three-quarters with remainders Dividends 100 to 999 a = 2 to 9 some zeroes

YEAR 4
BLOCK 24

DESCRIPTION: Special Drill on Addition, Subtraction, Multiplication, and Division

Thirty problems per daily drill

Level	Type	Notes
1	a + b = __ a + __ = c __ + b = c a + b = c + __ a + b = __ + d a + b = K K = __ a + b + c = __	Sums or minuends to 18
2	a - b = __ a - __ = c __ = b = c a - b = c - __ a - b = __ - d a - b = K K = __	Sums or minuends to 18
3	a x b = __ a x __ = c __ x b = c	Products to 81
4	a/b = __ a/__ = c __/b = c	Products to 81
5	a x b = c c/a = b 1/a of c = b	Products to 81 Sequenced, with random location of blanks

SUMMARY - YEAR 5

BLOCK	DESCRIPTION
1	Addition, One-and Two-Digit Vertical and Horizontal Format
2	Subtraction, One-and Two-Digit Horizontal and Vertical Formats
3	Addition and Subtraction, Two-and Three-Digit Vertical Format
4	Multiplication, Products to 144, Horizontal Format
5	Multiplication, Vertical Up to 1 x 4 Digit; Carry, No Carry
6	Mixed Drill: Multiplication, Division, Fractions
7	Division, Ladder Format
8	Measure
9	Multiplication, Products to 144, Vertical Format
10	Mixed Drill: Column Addition and Subtraction of Decimals, Multiplication, Exercises on the Commutative, Associative and Distributive Laws.
11	Division, Ladder Format
12	Fractions: Recognizing, Reducing, Inequalities, Adding and Subtracting
13	Measure, Decimals
14	Commutative, Associative and Distributive Laws
15	Division, Ladder Format
16	Fractions: Recognizing, Inequalities, Adding and Subtracting
17	Mixed Drill: Add, Subtract, Multiply, Divide
18	Measure, Decimals
19	Fractions: Recognizing, Adding, Subtracting, Inequalities
20	Mixed Drill: Decimals (Add and Subtract), Multiplication, Division, Fractions
21	Division Ladder Format
22	Mixed Drill: Long Division, Decimal Addition and Subtraction, Fractions and Column Multiplication
23	Entering Quotients Only in Division - Ladder Format: Student Gives Quotient Figures Only
24	Special Drills on Addition, Subtraction, Multiplication, and Division

14 problems per main lesson
**7 to 9 problems per review lesson*
**20 problems per main test*
**10 to 12 problems per review test*

*Some blocks have a greater number of problems to insure adequate practice or testing. Also, blocks with Ladder Division have fewer problems because of the several answers required during ladder division.

YEAR 5

BLOCK 1

DESCRIPTION: Addition, One-and Two-Digit Vertical and Horizontal Format

Level	Type	Notes
1	a + bc ab + c ab + __ = cd ab + c = __	No carry
2	__ + b = cd a + __ = cd ab + c a + bc	Carry to 10's in vertical problems
3	ab + cd = __ __ + c = de a + __ = de ab + cd	Carry to 10's in vertical problems
4	ab + c = __, a + bc = __ ab + __ = de	Carry in all problems
5	ab + cd = __ __ + c = de ab + __ = de	No carry Carry to 10's

YEAR 5
BLOCK 2

DESCRIPTION: Subtraction, One- and Two-digit Horizontal and Vertical Formats

Level	Type	Notes
1	ab -c ab - c = __	No borrow
	ab -c ab - c = __	Borrow from 10's
2	ab -c __ - b = c	No borrow
	a - __ = c	
3	ab -cd ab - cd = __	No borrow
	ab - __ = de	
	__ - c = de	
4	ab -cd	No borrow
	ab - c = __	Borrow from 10's
	ab - __ = ef	
	__ - cd = ef	
5	ab - cd = __	No borrow
	ab -c ab - cd = __	
	__ - c = de	Borrow from 10's

YEAR 5
BLOCK 3

DESCRIPTION: Addition and Subtraction, Two- and Three-Digit Vertical Format

Level	Type	Notes
1	ab -cd __ - cd = ef	No borrow or carry
	ab +cd __ + cd = ef	
	ab - c = __	Borrow, carry
	ab - __ = de	
	ab + c = __	
	ab + __ = de	
2	ab - cd = __	Borrow, carry
	ab + cd = __ ab -cd	
	__ - c = de	
	ab - c = __	
	ab + cd + __	
	ab +cd a + bc = __	
3	__ - cd = ef	No borrow
	ab -cd ab - cd = __	Borrow, carry
	abc +de ab +cde ab + __ = de	
	__ + c = de	

Level	Type	Notes
4	a + b + = __	Borrow, carry
	abc -def	
	abcd -efgh	
	__ - cd = ef	
	ab - __ = ef	
	abc +def	
	__ + c = de	
5	abc -def	Borrow, carry
	abcd -efgh	
	abc +def	
	ab + cd = __	No carry
	__ + cd = ef	
	ab + __ = ef	

YEAR 5
BLOCK 4

DESCRIPTION: Multiplication, Products to 144, Horizontal Format

Level	Type	Notes
1	a x b = __	Products range 0 to 24
2	a x b = __	Products range 12 to 64
3	a x b = __	Products range 20 to 81
4	a x b = __ a x __ = c __ x b = c	Products range 27 to 81
5	a x b = __ a x __ = c __ x b = c	Products range 54 to 144

YEAR 5
BLOCK 5

DESCRIPTION: Multiplication, Vertical Up to 1 x 4 Digit; Carry, No Carry

Level	Type	Notes
1	a x b	Products to 81
2	a ab x b x c	Products to 81 no carry
3	ab ac x c x d	No carry
4	ab abc x c x d	Carry to 10's column in half of problems
5	abc abcd x d x e	Some problems, no carry Some problems, carry to 10's place Some problems, carry to 100's place Some problems, carry to 10's and 100's place

YEAR 5

BLOCK 6

DESCRIPTION: Mixed Drill: Multiplication, Division, Fractions

There are three types of problems on each drill in the following sequence:

$a \times b = c$

$c / a = b$

$\frac{1}{a}$ of $c = b$

Level	Type	Notes
1		Products range from 0 to 24
2		Products range from 12 to 39
3		Products range from 20 to 64
4		Products range from 27 to 81
5		Products range from 54 to 144

YEAR 5
BLOCK 7

DESCRIPTION: Division, Ladder Format

Level	Type	Notes
1	$a/\overline{bc}$	No remainders dividends (10 to 99), a = 2 to 9 1 step, some zeroes random blank
2	$a/\overline{bc}$	Half with remainders dividends (10 to 99), a = 2 to 9 1 step, some zeroes random blank
	$a/\overline{bcd}$	No remainders dividends (100 to 999), a = 2 to 9 2 steps, some zeroes blank on right
3	$a/\overline{bcd}$	Half with remainders dividends (100 to 999), a = 2 to 9 1, 2 or 3 step problems, some zeroes blank on right
4	$a/\overline{bcd}$	Half with remainders dividends (100 to 999), a = 2 to 9 some zeroes random blank
5	$a/\overline{bcd}$	Three-quarter with remainders dividends (100 to 999), a = 2 to 9 some zeroes random blank

YEAR 5
BLOCK 8

DESCRIPTION: Measure

Length: yards, feet, inches
Weight: pounds, ounces
Time: hours, minutes, seconds
years, months, weeks, days
Surface measure: area
Money: coins, bills
Liquid measure: pints, gallons
Quantity: Units, dozens

Level 5 includes multiple - answer problems

YEAR 5
BLOCK 9

DESCRIPTION: Multiplication, Products to 144, Vertical Format

Level	Type	Notes
1	ab × c abc × d	Products 15 to 45 No carry
2	ab × c abc × d ab × cd	Products 20 to 64 Carry
3	ab × c abc × cd ab × cd abc × de	Products 27 to 81
4	ab × c abc × d ab × cd abc × de	Products 45 to 96
5	ab × c abc × d ab × cd abc × de	Products 60 to 144

YEAR 5

BLOCK 10

DESCRIPTION: Mixed Drill: Column Addition and Subtraction of Decimals, Multiplication, Exercise on the Commutative, Associative and Distributive Laws.

Level	Type				Notes
1	ab -cd	ab -cd	a.bc +d.ef	a.bc -d.ef	Regrouping not required
	ab xc	CAD Laws			
2	ab -cd	ab -cd	a.bc +d.ef	a.bc -d.ef	Regrouping required
	ab xc	CAD Laws			
3	abc +def	abc -def	a.bc +d.ef	a.bc -d.ef	Regrouping required
	abc x d	CAD Laws			
4	abc +de	abc +def	abcd +efgh	ab.cd +de.fg	
	abc x d	CAD Laws			

Level	Type				Notes
5	abc def +ghi	a.bc d.ef +g.hi	abcd +efg	a.bc +d.ef	Regrouping required
	abc xde	CAD Laws			

YEAR 5
BLOCK 11

DESCRIPTION: Division, Ladder Format

Level	Type	Notes
1	$a/\overline{bcd}$	Dividends 100 to 999 no remainders blank on right a = 2 to 9
2	$a/\overline{bcd}$	Dividends 100 to 999 no remainders a = 2 to 9 3 step problems no zeroes blank on right
	$a/\overline{bcde}$	Dividends 1000 to 9999 no remainders a = 2 to 9 some zeroes blank on right
3	$a/\overline{bcde}$	Dividends 1000 to 9999 some remainders a = 2 to 9 some zeroes blank on right
	$ab/\overline{cdef}$ (b = 0)	Dividends 1000 to 9999 some remainders a = (1 to 9) x 10 some zeroes blank on right

Level	Type	Notes
4	$ab/\overline{cdef}$ (b = 0)	Dividends 1000 to 9999 half with remainders a = (1 to 9) x 10 some zeroes random blank
	$ab/\overline{cdefg}$ (b = 0)	Dividends 1000 to 9999 half with remainders a = (1 to 9) x 10 some zeroes random blank
5	$ab/\overline{cdef}$ (b ≠ 0)	Dividends 1000 to 9999 some remainders a = 11 to 99 some zeroes random blank
	$ab/\overline{cdefg}$ (b ≠ 0)	Dividends 1000 to 99999 some remainders a = 11 to 99 some zeroes random blank

YEAR 5
BLOCK 12

DESCRIPTION: Fractions: Recognizing, Reducing, Inequalities, Adding and Subtracting

Level	Type	Notes
1	How many equal parts ... Identifying (i.e., a/b b = __) Inequalities	Add and subtract fractions with like denominators, no reducing.
2	Identifying (i.e., 1/a b = __) Inequalities	Add and subtract fractions with like denominators, no reducing.
3	Identifying (i.e., a/b c = __) Inequalities	Add and subtract fractions with unlike denominators, no reducing.
4	Completions (i.e., a/b = __/d) Inequalities	Add and subtract fractions with unlike denominators, no reducing.
5	Inequalities	Add and subtract fractions with unlike denominators and reducing answers to lowest terms.

DESCRIPTION: Measure, Decimals

Topics covered are: Time, money, liquid measure, length, weight and quantity.

Decimal addition and subtraction criteria are as follows:

Level	Type	
1	.a +.b	.c -.a
	.a + .b = __	
	.c - .a = __	
2	.ab +. c	.cd -.ab (a = 0)
	.ab +. c (a = 0)	.cd -.ab (b = 0)
3	.ab +.cd	.cd -.ab
	a.bc +.de (d = 0)	d.ef -a.bc
4	a.bc +d.ef	c.de -.ab
	a.bc +.de	d.ef -a.bc
5	a.bc d.ef +g.hi	e.fgh -a.bcd
	a.bcd +e.fgh	f.ghi -.abc

YEAR 5
BLOCK 14

DESCRIPTION: Commutative, Associative and Distributive Laws

All five levels of the block are concerned with the application and use of these laws of arithmetic to addition, subtraction, multiplication, and division.

YEAR 5
BLOCK 15

DESCRIPTION: Division, Ladder Format

Level	Type		Notes
1	$a/\overline{bcd}$		Dividends 100 to 999 a = 2 to 9 no zeroes blank on right no remainders
	$a/\overline{bcde}$		Dividends 1000 to 9999 a = 2 to 9 some zeroes blank on right on remainders
2	$ab/\overline{cde}$	(b = e = 0)	Dividends (10 to 99) x 10 a = (1 to 9) x 10 some zeroes random blank no remainders
	$ab/\overline{cdef}$	(b = e = 0)	Dividends (100 to 999) x 10 a = (1 to 0) x 10 some zeroes random blank no remainders
3	$ab/\overline{cdef}$		Dividends 1000 to 9999 a = 10 to 99 some remainders some zeroes random blank
	$ab/\overline{cdefg}$	($b \neq 0$)	Dividends (1000 to 99999) a = 11 to 99 some remainders some zeroes random blank

YEAR 5

BLOCK 15 (Cont'd)

Level	Type		Notes
4	$ab/\overline{cdef}$	($b \neq 0$)	Dividends (1000 to 9999) a = 11 to 99 some remainders some zeroes random blank
	$ab/\overline{cdefg}$	($b \neq 0$)	Dividends (1000 to 99999) a = 11 to 99 some remainders some zeroes random blank
5	$ab/\overline{cdef}$	($b \neq 0$)	Dividends (1000 to 9999) a = 11 to 99 some zeroes some remainders random blank
	$ab/\overline{cdefg}$	($b \neq 0$)	Dividends (10000 to 99999) a = 11 to 99 some zeroes some remainders random blank

DESCRIPTION: Recognizing, Inequalities, Adding and Subtracting

Level	Type
1	Identifying (i.e., 1/a of b = __) Inequalities Add and subtract fractions with like denominators, no reducing.
2	Identifying (i.e., a/b of c = __) Equivalence (i.e., a/b = __/d) Inequalities Add and subtract fractions with unlike denominators, no reducing.
3	Equivalence (i.e., a/b = __/d) Inequalities Add and subtract fractions with unlike denominators, reducing answers.
4	Inequalities Add and subtract fractions with unlike denominators, reducing answers.
5	Inequalities Add and subtract fractions with unlike denominators, reducing answers.

YEAR 5

BLOCK 17

DESCRIPTION: Mixed Drill: Add, Subtract, Multiply, Divide

Level	Type	Notes
1	abc +def	No carry
	def -abc	No borrow
	abc x d	No carry
	a/bcd	Dividends 100 to 999 a = 2 to 9 2 step no remainders no zeroes blank on right
2	abc +def	Carry & borrow
	def -abc	Borrow from 10's
	abc x d	Carry to 10's
	a/bcd	Dividends 100 to 999 a = 2 to 9 2 step all with remainders no zeroes blank on right

Level	Type		Notes
3	abc +def	abcd +efgh	Carry to 10's or 100's
	def -abc	efgh -abcd	Borrow from 10's or 100's
	abc xde	a/bcde	No carry
			Dividends 1000 to 9999 a = 2 to 9 3 step all with remainders some zeroes blank on right
4	abc +def	abcd +efgh	Carry to 10's and 100's
	def -abc	efgh -abcd	Borrow from 10's and 100's
	abc x d		Carry to 10's & 100's
	ab/cdef	b = 0	Dividends 1000 to 9999 a = (1 to 9) x 10 all with remainders some zeroes random blank
5	abc +def	abcd +efgh	Carry to all places
	def -abc	def -abc	Borrow from all places
	abc xde	ab/cdef	b ≠ 0 Carry as needed
			Dividends (1000 to 9999) a = 11 to 99 no remainders some zeroes random blank

YEAR 5

BLOCK 18

DESCRIPTION: Measure, Decimals

Measures: Counting, money, time, length, area measure, quantity, liquid measure, weight.

Levels	Type		Notes
1	.a + .b = __	.a +.b	Facts to 20
	.c - .a = __	.c -.a	
2	.ab +.cd	.ab +.c	No regrouping
	.bc -.oa	.cd -.ab	
3	.ab +.cd	a.bc +.de	Some regrouping (10's place)
	.cd -.ab	.def -.abc	
4	a.bc +d.ef	a.bc +.de	Some regrouping (100's place)
	c.de -.ab	d.ef -a.bc	
5	a.bc d.ef +g.hi	a.bcd +.efg	Regrouping in all places
	a.bcd -.efg	a.bcd -e.fgh	

YEAR 5
BLOCK 19

DESCRIPTION: Fractions: Recognizing, Adding, Subtracting, Inequalities

Level	Type
1	Indentify (i.e., 1/a of b = __) Inequalities Add & subtract fractions with unlike denominators, some reducing
2	Equivalence (i.e., a/b = __/d) Inequalities Add & subtract fractions with unlike denominators, reducing
3	Inequalities Add & subtract fractions with unlike denominators, reducing
4	Inequalities Add & subtract fractions with unlike denominators, reducing, some mixed numbers
5	Inequalities Add & subtract mixed numbers (fractions having unlike denominators), reducing

YEAR 5

BLOCK 20

DESCRIPTION: Mixed Drill, Decimals (Add and Subtract), Multiplication, Division Fractions

Level	Type	Notes
1	a.bc +d.ef	No carry
	d.ef -a.bc	No borrow
	abc x d	No carry
	a/bcd	Dividends 100 to 999. a = 2 to 9 some zeroes no remainders random blank
	Two fraction problems (1 add and 1 subtract)	
2	a.bc +d.ef	Carry to 10's
	d.ef -a.bc	Borrow from 10's
	abc x d	Products 20-64; carry in 10's & 100's
	a/bcd	Dividends 100 to 999 a = 2 to 9 some zeroes all with remainders random blank
	Two fraction problems (1 add and 1 subtract)	

Level	Type	Notes
3	a.bcd +e.fgh	Carry to 10's or 100's
	ab.cd -ef.gh	Borrow from 10's or 100's
	abc xde	No carry
	a/bcde	Dividends 1000 to 9999 a = 2 to 9 some zeroes some remainders blank on right
	Two fraction problems (1 add and 1 subtract)	
4	a.bcd +e.fgh	Carry to 10's and 10's and 100's
	e.fgh -a.bcd	Borrow from 10's
	abc x d	Products 27-81; carry in 10's & 100's places
	ab/cdef	Dividends (100 to 999)x 10 a = (1 to 9)x 10 No remainders blank on right
	Two fraction problems (1 add and 1 subtract, involving mixed numbers)	
5	a.bcd +e.fgh	Carry in all places
	ab.cd -ef.gh	Borrow from all places
	bcd xde	Products 0-81 (b ≠ 0)

YEAR 5
BLOCK 20 (Cont'd)

Level	Type	Notes
5 (Cont'd)	$ab/\overline{cdef}$	Dividends 100 to 9999 a = 11 to 99 some zeroes some remainders random blank
	Two fraction problems (1 add and 1 subtract, involving mixed numbers	
	$ab/\overline{cdefg}$	Dividends 10000 to 99999 a = 11 to 99 some zeroes some remainders random blank

DESCRIPTION: Division, Ladder Format

Level	Type			Notes
1	$a/\overline{bcd}$	$a/\overline{bcde}$		No remainders
2	$ab/\overline{cde}$	$ab/\overline{cdef}$	$(b = 0)$	Half with remainders
3	$ab/\overline{cdef}$	$ab/\overline{cdef}$	$(b \neq 0)$	Half with remainders
4	$ab/\overline{cdef}$	$ab/\overline{cdefg}$	$(b \neq 0)$	Half with remainders, zeros in one's place in quotient
5	$ab/\overline{cdef}$	$ab/\overline{cdefg}$	$(b \neq 0)$	Half with remainders, zeroes in quotient

YEAR 5

BLOCK 22

DESCRIPTION: Long Division, Decimal Addition and Subtraction, Fractions and Column Multiplication

Level	Type	Notes
1	$a/\overline{bcd}$	No remainders
	a.bc +d.ef	No carry
	d.ef -a.bc	No borrow
	abc x d	No carry
2	$a/\overline{cde}$	With remainders
	a.bc +d.ef	Carry to 10's
	d.ef -a.bc	Borrow from 10's
	abc x d	Products 20 to 64
3	$ab/\overline{cdef}$	With remainders
	a.bcd +e.fgh	Carry to 10's or 100's
	ab.cd -ef.gh	Borrow from 10's or 100's
	abc xde	No carry

Level	Type		Notes
4	$ab/\overline{cdef}$	(b = 0) (f = 0)	With remainders
	e.fhg -a.bcd		Borrow from 10's and 100's
	a.bcd -e.fgh		Carry to 10's and 100's
	abc x d		Products 27 to 81; carry in all places
5	$ab/\overline{cdef}$	(b ≠ 0)	With remainders
	a.bcd +e.fgh		Carry in all places
	ab.cd -ef.gh		Borrow from all places
	abc xde		

YEAR 5
BLOCK 23

DESCRIPTION: Entering Quotients Only in Division - Ladder Format: Student Gives Quotient Figures Only

Level	Type	Notes
1	$a/\overline{bc}$	No remainders
2	$a/\overline{bc}$ $a/\overline{bcd}$	One-quarter with remainders no zeroes in quotient
3	$a/\overline{bcd}$	Half with remainders some zeroes
4	$a/\overline{bcd}$	Half with remainders some zeroes
5	$a/\overline{bcd}$	Three-quarters with remainders some zeroes

YEAR 5
BLOCK 24

DESCRIPTION: Special Drills on Addition, Subtraction, Multiplication, and Division

Level	Type
1	a + b = __ a + __ = c __ + b = c a + b = c + __ a + b = __ + d a + b = K K = __
2	a - b = __ a - __ = c __ - b = c a - b = c - __ a - b = __ - d a - b = K K = __
3	a x b = __ a x __ = c __ x b = c
4	a/b = __ a/__ = c __/b = c
5	Mixture of the above

SUMMARY - YEAR 6

BLOCK	DESCRIPTION
1	Addition, Subtraction (Decimals), Addition and Subtraction in Vertical Format
2	Multiplication, Products to 144, Horizontal Format
3	Column Multiplication, Vertical Format
4	Division, Ladder Format
5	Fractions: Factors, Reducing Comparing, Simple Addition and Subtraction
6	Addition, Subtraction, Multiplication, Division, Exponents, Inequalities
7	Division: Ladder Format
8	Fractions: Add, Subtract, Multiply, Divide, Horizontal Format
9	Measure: Length, Time, Money, Liquid Measure
10	Ratio: Percent
11	Division: Ladder Form, 2-Digit Divisors
12	Mixed Drill: Fractions, Ratio - Percent, Division, Decimals
13	Fraction and Decimals: Add, Subtract, Multiply, Inequalities, Rounding Changing to Fractional Numeral
14	Commutative, Associative and Distributive Laws
15	Multiplication and Division Involving Multiples of 10
16	Division, 2-Digit Divisors, 3-5 Digit Dividends, Ladder Format
17	Mixed Drill Fractions, CAD Laws, Division, Add, Subtract, Multiply Vertical Format
18	Measures
19	Ratio, Percent
20	Mixed Drill: Ratio - Percent, Decimals, Fractions
21	Negative Numbers
22	Mixed Drill: Multiplication, Division, Decimals
23	Entering Quotients Only in Division
24	Special Drills on Addition, Subtraction, Multiplication, and Division

14 problems per main lesson
**7 to 9 problems per review lesson*
**20 problems per main test*
**10 to 12 problems per review test*

*Some blocks have a greater number of problems to insure adequate practice or testing. Also, blocks with Ladder Division have fewer problems because or the several answers required during Ladder Division

YEAR 6
BLOCK 1

DESCRIPTION: Addition, Subtraction (Decimals), Addition and Subtraction in Vertical Format

Level	Type	Notes
1	ab + cd a.bc + d.ef	No borrow or carry
2	ab + cd ab + cd a.bc + d.ef	Carry to (or borrow from) 10's place
3	abc + de a.bc + d.ef	Carry to (or borrow from 10's and/or 100's place.
4	abc + def abcd + efg abcd + efgh a.bcd + e.fgh	Carry to (or borrow from) 10's 100's and/or 1000's place Use some zeros
5	abc + def abcd + efg abcd + efgh a.bc + d.ef + g.hi	Carry to (or borrow from) 10's 100's and/or 1000's place Use zero at times

YEAR 6
BLOCK 2

DESCRIPTION: Multiplication, Products to 144, Horizontal Format

Level	Type	Notes
1	a x b = __	Products 12 to 35
2	a x b = __	Products 20 to 64
3	a x b = __	Random blank Products 27 to 81
4	a x b = c	Random blank Products 54 to 100
5	a x b = c c = a x b	Random blank Products 72 to 144

YEAR 6
BLOCK 3

DESCRIPTION: Column Multiplication, Vertical Format

Level	Type	Notes
1	ab × c; abc × d	No carry
2	ab × c; abc × d	Carry
	ab × cd	No carry
3	ab × c; abc × d	
	ab × cd; abc × de	No carry
4	ab × c; abc × d	
	ab × cd; abc × de	
5	ab × c; abc × d	
	ab × cd; abc × de	

YEAR 6
BLOCK 4

DESCRIPTION: Division, Ladder Format

Level	Type		Notes
1	$a/\overline{bc}$	$a/\overline{bcd}$	No remainders
2	$a/\overline{bc}$ $a/\overline{bcde}$	$a/\overline{bcd}$	Half the problems have remainders
3	$a/\overline{bcd}$	$a/\overline{bcde}$	Some remainders
4	$a/\overline{bcd}$	$a/\overline{bcde}$	Some remainders Some zeroes quotients
5	$a/\overline{bcde}$		Some remainders Some zeroes in quotients

YEAR 6
BLOCK 5

DESCRIPTION: Factors, Reducing Comparing, Simple Addition and Subtraction

Level	Notes
1	arrays, add and subtract, comparing fractions with numerator = 1, common denominators
2	arrays, add and subtract, comparing fractions with numerators ≠ 1, common denominators
3	reducing fractions, inequalities
4	changing fractions to higher terms, inequalities, add and subtract
5	inequalities and two-step add and subtraction problems

YEAR 6
BLOCK 6

DESCRIPTION: Addition, Subtraction, Multiplication, Division, Exponents, Inequalities

Inequalities ENTER < OR = OR >

a + b __ c + d

Exponents* a↑2 = __ a↑3 = __

Level	Type	Notes
1	Inequalities:	Sums 0 to 18, products 12 to 35
	ab + c ; ab + cd	No borrow or carry
	ab x c	No carry
	a/bc	No remainders
2	Inequalities:	Sums 10 to 18, products 20 to 64
	ab + cd ; ab + ef	No borrow or carry
	ab x c	No carry in addition of partial products
	a/bcd	Half remainders

* The computer uses an up arrow (↑) to denote an exponent.
For example, X^2 is written: X↑2.

YEAR 6
BLOCK 6 (Cont'd)

Level	Type	Notes
3	Inequalities:	Sums 15 to 25, products 27 to 81
	$\begin{array}{r} abc \\ \pm\ de \\ \hline \end{array}$ $\quad$ $\begin{array}{r} abc \\ \pm def \\ \hline \end{array}$	Carry to (borrow from) 10's only
	$\begin{array}{r} abc \\ \times\ \ d \\ \hline \end{array}$	No carry in addition of partial products
	$a/\overline{bcd}$	Some remainders
4	$a/\overline{bcd}$	
	$\begin{array}{r} ab \\ \times cd \\ \hline \end{array}$	
5	$a/\overline{bcde}$	
	$\begin{array}{r} ab \\ \times cd \\ \hline \end{array}$	

DESCRIPTION: Division: Ladder Format

Level	Type		Notes
1	$a/\overline{bcd}$	$a/\overline{bcde}$	No remainder
	$a/\overline{bcdef}$		
2	$a/\overline{bde}$	$a/\overline{bcdef}$	No remainder
	$ab/\overline{cde}$	(b = 0)	Right blank
		e = 0	
3	$a/\overline{bcde}$	$ab/\overline{cde}$	Remainder
	$a/\overline{bcdef}$		No remainder
4	$a/\overline{cde}$	a = e = 0	
	$ab/\overline{cdefg}$	(b = 0)	
		g = 0	
	$a/\overline{bcdef}$		Remainder
5	$ab/\overline{cdef}$	b = 0	Remainder
	$ab/\overline{cdefg}$	b ≠ 0	Remainder
	$ab/\overline{cdefg}$	(b = 0)	
		g = 0	

YEAR 6
BLOCK 8

DESCRIPTION: Add, Subtract, Multiply, Divide, Horizontal Format

Level	Type
1	Addition and Subtraction of fractions with like denominators. No reducing.
2	Addition and Subtraction of fractions with unlike denominators (unlike by a multiple of 2) 2-step and 3-step problems.
3	Addition and Subtraction of fractions with unlike denominators (unlike, but multiples of each other, $\geq$ 2) 2-step and 3-step problems.
4	1-step and 2-step addition and subtraction. Some problems with mixed numbers. Multiplication and Division involving (a) a whole number and a fraction (b) both factors fractions
5	2-step and 3-step addition and subtraction. Some problems with mixed numbers. Division involving (a) a whole number and a fraction or (b) both factors are fractions

DESCRIPTION: Measure: Length, Time, Money, Liquid Measure

Time:	seconds, minutes, hours, days
	weeks, months, years, centuries
Liquid Measure:	cup, pint, quart, gallon
Money:	coins
Length:	inches, feet, yard, mile
Weight:	ounce, pound
Area:	square inches, square feet,
	square yards

YEAR 6
BLOCK 10

DESCRIPTION: Ratio: Percent

All levels have problems of the same form, varying the distribution of them at each level.

The forms are:
(1) a/b = __/100
(2) a/b = __/d, d ≠ 100.
(3) a/b = c/__.
(4) a/b IS EQUIVALENT TO __/100.
(5) a/b IS EQUIVALENT TO __/d, d ≠ 100.
(6) a/b IS EQUIVALENT TO c/__.

The lower levels have a heavier concentration of the first 3 forms, the upper levels have a heavier concentration of forms (4), (5), and (6).

YEAR 6
BLOCK 11

DESCRIPTION: Division: Ladder Form, 2-Digit Divisors

Level	Type		Notes
1	$a/\overline{bcde}$	$e \neq 0$	
	$a/\overline{bcde}$	$b = 0$	No remainders
		$f = 0$	right blank
2	$a/\overline{bcde}$	$e = 0$	No remainders
	$ab/\overline{cdef}$	$f = 0$	right blank
	$ab/\overline{cdefg}$	$b = 0$	
		$g = 0$	
3	$ab/\overline{cdefg}$	$b = 0$	No remainders
		$g = 0$	right blank
4	$ab/\overline{cdef}$	$b \neq 0$	Half with remainders
5	$ab/\overline{cdefg}$	$b \neq 0$	Half with remainders

YEAR 6
BLOCK 12

DESCRIPTION: Mixed Drill: Fractions, Ratio - Percent, Division, Decimals

Level	Type	Notes
1	Add and subtract fractions. a/b = __ 100 a/b = __ d a/b = c/ __	Like denominators no reducing
	a/$\overline{bcde}$	No remainder right blank
	Add and subtract and multiply decimals.	No regrouping, products 0 to 24
2	Add and subtract fractions. a/b = __ / 100 a/b = __ / d a/b = c / __	Unlike denominators reducing
	ab/$\overline{cdef}$ b = 0 f = 0	No remainder right blank
	Add, subtract, and multiply decimals.	No regrouping, products 15 to 45
3	Add and subtract fractions a/b = __ / 100 a/b = __ / d a/b = c / __ a/b IS EQUIVALENT TO __ / 100 a/b IS EQUIVALENT TO __ / d a/b IS EQUIVALENT TO c/__	Unlike denominators, reducing
	ab/$\overline{cdefg}$ b = 0 g = 0	No remainder, right blank
	Add, subtract and multiply decimals	Regrouping in 10's place products 25 to 64

Level	Type	Notes
1	Add, subtract, multiply and divide fractions a/b IS EQUIVALENT TO __ / 100 a/b IS EQUIVALENT TO __ / d a/b IS EQUIVALENT TO c / __	
	$ab/\overline{cdef}$ $b \neq 0$ Add, subtract and multiply decimals	Remainder Regrouping in one or two places Products 30 to 81
2	Add, subtract, and divide fractions a/b is equivalent to __ / 100	
	$ab/\overline{cdef}$ $b \neq 0$ Add, subtract and multiply decimals	Remainder Regrouping in one or two places Products 36 to 81

YEAR 6
BLOCK 13

DESCRIPTION: Fraction and Decimals: Add, Subtract Multiply, Inequalities, Rounding, Changing to Fractional Numeral

Level	Type	Notes
1	Changing to fractional numeral: .ab = __ / 100 .ab = __ / 100 .ab = ab / __ ab / 100 = .__ ab / 10 = .__ Inequalities Add and subtract; vertical format	
2	Changing to fractional numeral: .ab = __ / 100 .ab = __ / 10 .ab = ab / __ ab / 100 = .__ ab / 10 = .__ Inequalities Add and subtract; vertical format	
3	Add and subtract; vertical format	Rounding off to nearest tenth and hundredth
4	Add and subtract; vertical format. Multiply; vertical format.	Rounding off to nearest tenth and hundredth
5	Add and subtract; vertical format. Multiply; vertical format	Rounding off to nearest tenth and hundredth

YEAR 6
BLOCK 14

DESCRIPTION: Commutative, Associative and Distributive Laws

All five levels of the block are concerned with the application and use of these laws of arithmetic to addition, subtraction, multiplication, and division.

YEAR 6
BLOCK 15

DESCRIPTION: Multiplication and Division Involving Multiples of 10

All levels have problems of the form a x b = __, where a and/or b is a multiple of 10.

The division problems are of the form $a/\overline{b}$, where a and b are multiples of 10.

Level	Notes
1	Products and dividends 15 45 ($\times 10^n$).
2	Products and dividends 20 64 ($\times 10^n$)
3	Products and dividends 27
4	Products and dividends 54 to 100 ($\times 10^n$).
5	Products and dividends 72 to 144 ($\times 10^n$).

YEAR 6
BLOCK 16

DESCRIPTION: Division, 2-Digit Divisors, 3-5 Digit Dividends, Ladder Format

Level	Type			Notes
1	$ab/\overline{cde}$	$ab/\overline{cdef}$	$b = 0$	No remainders
2	$ab/\overline{cdef}$	$ab/\overline{cdefg}$	$b = 0$	No remainders
	$ab/\overline{cde}$		$b \neq 0$	
	$ab/\overline{cde}$		$b \neq 0$	
3	$ab/\overline{cdefg}$		$b = 0$	
	$ab/\overline{cde}$	$ab/\overline{cdef}$	$b \neq 0$	
4	$ab/\overline{cde}$	$ab/\overline{cdef}$		
	$ab/\overline{cdefg}$		$b \neq 0$	Some remainders
5	$ab/\overline{cdef}$	$ab/\overline{cdefg}$	$b \neq 0$	Some remainders

YEAR 6
BLOCK 17

DESCRIPTION: Mixed Drill Fractions, CAD Laws, Division, Add, Subtract Multiply Vertical Format

Levels	Type	Notes
1	Add and subtract fractions	Like denominators
	CAD Laws	Completion
	$ab/\overline{cde}$ b = 0	No remainder
	ab cd +cd -ab	No regrouping
	ab x c	No carry
2	Add and subtract fractions	Unlike denominators
	CAD Laws	Completion
	$ab/\overline{cdef}$ b = 0	No remainder
	ab cd cd +ef -ab	No regrouping
	abc x d	No carry
3	Add and subtract fractions	Unlike denominators
	Multiply fraction and whole number	
	CAD laws	Completion
	$ab/\overline{cdefg}$ b = 0 or	
	$ab/\overline{cde}$ b ≠ 0	Some remainders
	abc def +de -ab	Regrouping 10's
	ab xcd	No carry in products

Level	Type		Notes
4	Add and subtract fractions		Unlike denominators
	Multiply fraction and whole number		
	CAD Laws		Completion
	ab/cde		
	ab/cdef	$b \neq 0$	Some remainders
	abcd +efg	abcd -fgh	Regrouping at any position
	ab xcd		
5	Add and subtract fractions		Unlike denominators
	Multiply fraction and whole number		
	CAD Laws		Completion
	ab/cdef		
	ab/cdefg	$b \neq 0$	Some remainders
	abcd +efgh	abcd -efgh	Regrouping at any position
	abc xde		

YEAR 6
BLOCK 18

DESCRIPTION: Measures

Topics covered are: Time, Length, Area, Volume,
Liquid Measure, Metric Measure

Levels 4 and 5 include some multiple-answer problems

DESCRIPTION: Ratio, Percent

Level	Type	Notes
1	1/b = __/100 OR 1/b IS EQUIVALENT TO __/100	In sequence
	1/b OF x = __	
	a/100 OF x = __	
	a/100 = __PERCENT; a/100 IS EQUIVALENT TO __PERCENT	
2	1/b = __/100 OR 1/b IS EQUIVALENT TO __/100	In sequence
	1/b OF x = __	
	a/100 OF x = __	
	a/100 IS EQUIVALENT TO __PERCENT also:	
	a/b = __/100 = __PERCENT	
3	a/b = __/100 OR __PERCENT	In sequence
	a/100 OF x = __	
	a PERCENT OF x = __	
	a/b = __/100	
	a/b OF x = __	
	a/100 __PERCENT	
	a/b IS EQUIVALENT TO __/100	
	a/100 IS EQUIVALENT TO __PERCENT	

YEAR 6
BLOCK 19 (cont'd)

Level	Type	Notes
4	a/b = __/100 = __PERCENT	In sequence
	a/100 OF x = __	
	a PERCENT OF x = __	
	a/100 = __PERCENT; a/b IS EQUIVALENT TO __/100	
	a/100 IS EQUIVALENT TO __PERCENT	
5	a/b IS EQUIVALENT TO __/100	In sequence
	a/100 IS EQUIVALENT TO __PERCENT	
	a/100 OF x = __	
	a PERCENT OF x = __	
	a/100 = __PERCENT	

DESCRIPTION: Ratio--Percent, Decimals, Fractions

Level	Type	Notes
1	Ratio--Percent	in sequence
	1/b = __/100 OR 1/b IS EQUIVALENT TO __/100	
	1/b OF x = __	
	a/100 = __ PER CENT; a/100 IS EQUIVALENT TO __ PER CENT	
	Decimal numerals	
	Changing to fractional numerals	
	Inequalities	
	Add and subtract, vertical format	
	Fractions	
	Add and subtract fractions with like denominators	
	No reducing	
2	Ratio--Percent	in sequence
	1/b = __/100 OR 1/b IS EQUIVALENT TO __/100	
	1/b OF x = __	
	a/100 OF x = __	
	a/100 = __ PER CENT IS EQUIVALENT TO PER CENT	
	a/b = __/100 = __ PER CENT	
	Decimal numerals	
	Changing to fractional numerals	
	Inequalities	
	Add and subtract, vertical format	
	Fractions	
	Add and subtract fractions with unlike denominators	

YEAR 6
BLOCK 20 (Cont'd)

Level	Type	Notes
3	Ratio--Percent	in sequence
	a/b = __/100 = __ PER CENT	
	a/100 OF x = __	
	a PER CENT OF x = __	
	a/b = __/100 a/b of x = __ a/100 = __ PER CENT	
	a/b IS EQUIVALENT TO __/100 IS EQUIVALENT TO __ PER CENT	
	a/b IS EQUIVALENT TO __/100 IS EQUIVALENT TO __ PER CENT	
	Decimal numerals	
	Add and subtract, vertical format	
	Rounding off to nearest tenth and hundredth	
	Fractions	
	Add and subtract fractions with unlike denominators	
4	Ratio--Percent	in sequence
	a/b = __/100 = __ PER CENT	
	a/100 OF x = __	
	a PER CENT OF x = __	
	a/100 = __ PER CENT	
	a/b IS EQUIVALENT TO __/100 a/100 IS EQUIVALENT TO __ PER CENT	
	Decimal numerals	
	Add and subtract, vertical format	
	Rounding off to nearest tenth and hundredth	
	Multiply, vertical format	
	Fractions	
	Add, subtract, multiply and divide	

Level	Type	Notes
5	Ratio--Percent	in sequence
	a/b IS EQUIVALENT TO __/100	
	a/100 IS EQUIVALENT TO __ PER CENT	in sequence
	a/100 OF x = __	
	a PER CENT OF x = __	
	a/100 = __ PER CENT	
	Decimals numerals	
	Add and subtract, vertical format	
	Rounding off to nearest tenth and hundredth	
	Multiply, vertical format	
	Fractions	
	Add, subtract multiply and divide	

YEAR 6

BLOCK 21

DESCRIPTION: Negative Numbers

For all addition problems, one or both of the numbers involved is a negative number.

For all multiplication problems, one of the numbers involved is negative.

Level	Type	Notes
1	a x b = __ a + b = __	Products 12 to 35
2	a x b = __ a + b = __	Products 20 to 81
3	a x b = __ a + b = __ a + __ = c a x __ = c __ + b = c __ x b = c	Products 27 to 81
4	a x b = __ ab + c = __ a x __ = c __ x b = c	Products 54 to 100

Level	Type	Notes
5	ab x c = __	Products 72 to 144
	a + b = __	
	ab + __ = de	
	a x __ = c	
	__ + c = de	
	__ x b = c	

YEAR 6

BLOCK 22

DESCRIPTION: Mixed Drill: Multiplication, Division, Decimals

Level	Type	Notes
1	a x b = __	
	a/$\overline{bcd}$	No remainder
	ab .ab +.cd -.cd	Borrow/carry in tenths column
2		Half each of Levels 1 and 3
3	a x b = c	Random blank
	ab/$\overline{cde}$	Some remainders
	a.bc a.bc +.de -.de	Borrow/carry in tenths column
4		Half each of Levels 3 and 5
5	c = a x b	Random blank
	ab/cdef	some zeros
	ab.c .abc +de.f -.def	Carry/borrow in tenths and hundredths column

YEAR 6
BLOCK 23

DESCRIPTION: Entering Quotients Only in Division

Ladder format: student gives quotient figures only

Level	Type	Notes
1	$a/\overline{bc}$	No remainders
2	$a/\overline{bc}$ $a/\overline{bcd}$	One-quarter with remainders
3	$a/\overline{bcd}$	Half with remainders
4	$a/\overline{bcd}$	Some zeroes Half with remainders
5	$a/\overline{bcd}$	Some zeros Three-quarters with remainders

YEAR 6
BLOCK 24

DESCRIPTION: Special Drills on Addition, Subtraction, Multiplication, and Division

Level	Type
1	a + b = __ a + b __ = c __ + b = c a + b = + __ a + b = __ + d a + b = K K = __
2	a - b = __ a - __ = c __ - b = c a - b = c - __ a - b = __ - d a - b = K K = __
3	a x b = __ a x __ = c __ x b = c
4	a/b = __ a/ __ = c __ /b = c
5	Mixture of the above

APPENDIX A

SYMBOLS USED IN THE D & P PROGRAM

Students should be prepared to recognize and/or type the symbols used in the program. This chart lists the symbols and meanings where they first appear, and the level of comprehension required.

Symbol	Meaning	Level of Comprehension	First Used In (Year, Block)
0-9	numerals	recognition, use	1-1
A-Z	edited alphabet	recognition, distinction between letters	1-1
___	underline	recognition	1-1
=	equals	recognition	1-3
+	addition	recognition	1-3
-	subtraction	recognition	1-5
>	greater than	recognition, use*	1-21
<	less than	recognition, use*	1-21
=	equals	recognition, use*	1-21
/	fraction bar	recognition	2-15
X	multiply	recognition	2-20
/	divide	recognition	3-13
/‾‾	long division	recognition	3-14
.	decimal point	recognition, use	5-10
↑	exponent	recognition	6-6

* Requires use of the *shift* key

APPENDIX B

VOCABULARY USED IN THE D & P PROGRAM *

Word/Phrase	First Used Year	Block
HOW MANY _X_ 'S	1	1
TYPE < OR = OR >	1	21
WHICH NUMBER COMES AFTER _3_ ?	2	6
IS IT _2_ OR _4_ ?	2	6
WHICH NUMBER COMES BEFORE _3_ ?	2	6
CENT(S), NICKEL(S), DIME(S)	2	10
HOW MANY EQUAL ROWS?	2	15
LOOK AT THE X'S	2	15
1/3 OF THE X'S = ___	2	15
HOW MANY 1/3'S = 1?	2	15
QUARTER(S), HALF DOLLAR(S), DOLLAR(S)	2	19
HOUR(S), MINUTE(S)	2	19
FOOT, FEET, INCH, INCHES	2	19
YARD(S)	3	9
POUND(S), OUNCE(S)	3	9
DOZEN(S)	3	9
TON(S)	3	15
SECOND(S) DAY(S), MONTH(S), YEAR(S)	3	16
CUP(S), PINT(S), QUART(S), GALLON(S)	3	16
THE LETTER M IS GIVEN 6 TIMES	3	17
1/3 OF 6 = ___	3	17
WEEK(S)	4	6
MILE(S)	6	9
SQ. IN., SQ. FT., SQ. YD.	6	9
PERCENT	6	10
MM., CM., M., KM.	6	18
ROUND OFF THE FOLLOWING NUMBERS TO THE NEAREST ___	6	20

*Does not include sign-in and sign-out messages